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Battelle Technical Review

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Operations Diagnosis Protects Profits

CHEMICAL EXPLORER

FRED BENINGTON

The rapid expansion of the field of chemistry is possible, of course, only because of the exploratory work of research chemists. One of those explorers into uncharted regions is Fred Benington. Much of his time is spent in studying new families of compounds. Using his chemical knowledge and mathematical skills, Fred builds pictures of little-known chemical systems in that never-never land between the organic and inorganic branches of chemistry. Then, on the basis of new data, he formulates general principles that enable him to penetrate deeper into the unknown.

Since joining Battelle in 1947, Fred's time has been devoted largely to the baffling problems associated with the mechanisms of combustion. He has been interested in charting the behavior of the rapidly moving fuel and gas molecules just before combustion. He is also investigating the chemistry of fuels to aid in the performance of jet and rocket motors.

Fred's theoretical approach is useful in other than combustion problems. He has investigated the chemistry of phosphorous and nitrogen compounds for use in the development of polymers and fibers. His studies on the thermodynamics and kinetics of the evaporation of liquid fuel droplets will be reported in a forthcoming monograph on *Injection of Liquids Into Gases*. In another area, Fred is helping with a Fels Foundation project to synthesize mescaline and its analogs for use in studying the metabolism of brain tissue.

Much of Fred's earlier experience and training pointed to his present interests. After working on continuous manufacture of chloropicrin for Innes, Speiden Company, he engaged in catalysis research on acetylene for Niacet Chemicals Corporation and made mathematical calculations on heat-transfer problems for Corning Glass Works. His study of chemistry and math, so important in his work, did not stop when Fred received his B.S. degree from Tufts College. He continued with graduate courses in these fields at Harvard, Niagara, and Cornell universities.

Just as Fred likes tough problems in the laboratory, he enjoys a rugged pastime—mountain climbing. He has climbed with the best in Europe and can boast of the first ascent of the east face of Mount Arrowhead in Colorado. In more placid moments, he plays the piano and pursues another hobby, photography.

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BATTELLE TECHNICAL REVIEW ABSTRACTS

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***Asterisks mark items that may be used in the Battelle Library only. None of the unbound materials listed below are available for interlibrary loan.**

1. AERONAUTICAL ENGINEERING

1* A Steady-Flow Aeroelastic Study by Electrical Analogy. Robert H. Scanlan. *Journal of the Aeronautical Sciences,* v. 20, Oct. 1953, p. 691-698.

Describes use of electrical tank "lifting surface calculator" of Malavard and Duquenne in France. Diagrams, tables. 8 ref.

2 Some Features of Artificially Thickened Fully Developed Turbulent Boundary Layers With Zero Pressure Gradient. P. S. Klebanoff and Z. W. Diehl. *U. S. National Advisory Committee for Aeronautics, Report* 1110, 1952, 27 p. (TL521 Un3r)

Describes several methods used. Measurements of mean velocity and spectrum and intensity of *u*-fluctuation which served as criteria for determining the state of the layer are presented. Graphs, photographs, diagram. 22 ref.

3 An Analysis of Laminar Free-Convection Flow and Heat Transfer About a Flat Plate Parallel to the Direction of the Generating Body Force. Simon Ostrach. *U. S. National Advisory Committee for Aeronautics, Report* 1111, 1953, 17 p. (TL521 Un3r)

Velocity and temperature distributions for various Prandtl numbers were computed. Theoretical and experimental values are in good agreement. Tables. 3 ref.

4 Spectrum of Turbulence in a Contracting Stream. H. S. Ribner and M. Tucker. *U. S. National Advisory Committee for Aeronautics, Report* 1113, 1953, 17 p. (TL521 Un3r)

Provides a quantitative explanation of observed changes in the root-mean-square velocity components of turbulence of wind-tunnel stream after passing through the tunnel contraction. Graphs, diagrams.

5 Heat Transfer and Skin Friction by an Integral Method in the Compressible Laminar Boundary Layer With A Streamwise Pressure Gradient. Ivan E. Beckwith. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3005, Sept. 1953, 55 p. (TL570 Un3t)

By comparison of numerical results with some exact solutions the method was shown to give accurate results for the case of boundary layer cooling when a fifth-degree polynominal is used for the thermal profile. Graphs. 27 ref.

6 Maximum Evaporation Rates of Water Droplets Approaching Obstacles in the Atmosphere Under Icing Conditions. Herman H. Lowell. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3024, Oct. 1953, 56 p. (TL570 Un3t)

Calculations were made for a wide variety of water droplet diameters, ambient conditions, and flight Mach numbers. Graphs, tables. 16 ref.

7 An Investigation Utilizing An Electrical Analogue of Cyclic Deicing of Hollow Steel Propellers With Internal Electric Heaters. Carr B. Neel, Jr. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3025, Oct. 1953, 31 p. (TL570 Un3t)

Shows the impracticability of using an internal tubular heater. Illustrates advantages of employing an internal shoe-type heater which distributes the heat more evenly to the blade surface. Tables, graphs, diagrams, photographs. 7 ref.

8 The Compressible Laminar Boundary Layer With Heat Transfer and Small Pressure Gradient. George M. Low. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3028, Oct. 1953, 68 p. (TL570 Un3t)

A perturbation method for the calculation of velocity and temperature profiles, skin friction, and heat-transfer characteristics is presented. Graphs, tables. 19 ref.

9 Preliminary Experimental Investigation of Low-Speed Turbulent Boundary Layers in Adverse Pressure Gradients. Virgil A. Sandborn. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3031, Oct. 1953, 37 p. (TL570 Un3t)

Skin friction was measured by using a local heat transfer instrument and employing a calibrated relation between heat transfer and skin friction. Graphs, photographs, diagrams. 14 ref.

10 Graphical Solution of Some Automatic-Control Problems Involving Saturation Effects With Application to Yaw Dampers for Aircraft. William H. Phillips. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3034, Oct. 1953, 41 p. (TL570 Un3t)

A graphical method is presented for determining the motion of a freely oscillating system of one degree of freedom stabilized by a controlling device which applies control force in proportion to displacement of the system, to its rate of change of displacement, or both. Graphs. 8 ref.

Books and Miscellaneous Publications

11 Aircraft Structural Mechanics. Franz R. Steinbacher and George Gerard. 346 p. 1952. Pitman Publishing Corp., N. Y. (TL671.6 St34a)

Covers classical applied mechanics topics essential in the analysis of the airframe; calculation of shear flows due to various loadings imposed upon the structure; and buckling of various elements used in the airframe.

12 The Psychology of Flight. Alex Varney. 269 p. 1953. D. Van Nostrand Co., New York. (RC1075 V43p)

The emotional and psychic factors that condition the human being's response to air-borne movement are studied in absorbing detail.

2. AGRICULTURE

13* Liquid Fertilizer. R. L. Luckhardt. *Agricultural Chemicals,* v. 8, Sept. 1953, p. 45-47.

Discusses kinds, application, properties, and potentialities of solutions. 4 ref.

14* Turf Insects. *Agricultural Chemicals,* v. 8, Sept. 1953, p. 48-49.

Describes tests made with granular dieldrin on lawns and turf. Photographs, tables.

15* Herbicidal Use of Phenyldimethylurea. S. S. Sharp, M. C. Swingle, G. L. McCall, M. B. Weed, and L. E. Cowart.

2. *Agriculture*

Agricultural Chemicals, v. 8, Sept. 1953, p. 56-57, 139, 141, 143.

Gives chemical and toxicological properties and field test results. Tables.

16 Granular 12-12-12. *Agricultural Chemicals*, v. 8, Sept. 1953, p. 58-59.

Gives properties and applications of new fertilizers, "Arcadian 12-12-12." Photographs.

17* The Future for Fungicides. George L. McNew. *Agricultural Chemicals*, v. 8, Oct. 1953, p. 44-47, 109-110, 113.

Discusses fungicidal action and formulation problems for a number of fungicides.

18* The Story Behind the Herbicide Chloro-IPC. Eugene D. Witman. *Agricultural Chemicals*, v. 8, Oct. 1953, p. 50-52.

Describes development of herbicide for controlling narrow-leaved plants such as grasses. Photographs.

19 The Effect of 2,4-D on Sprout Formation in Cyperus Rotundus. T. J. Muzik and H. J. Cruzado. *American Journal of Botony*, v. 40, July 1953, p. 507-512.

Suggests that methods of control of this weed should include disturbing the root system before treating with 2,4-D. Diagrams, tables. 15 ref.

20* Tolerance, Toxicity, and Carolic Availability of Intravenously Injected Oxypolygelatin Solution in Rabbits. Lawrence E. Detrick, Virginia Debley, and Thomas J. Haley. *American Pharmaceutical Association, Journal, (Scientific Ed.)*, v. 42, Oct. 1953, p. 623-626.

Includes table, graph. 22 ref.

21* Rodent Repellent Studies. IV. Preparation and Properties of Trinitrobenzene-Aryl Amine Complexes. James B. DeWitt, Ervin Bellack, and Jack F. Welch. *American Pharmaceutical Association, Journal, (Scientific Ed.)*, v. 42, Nov. 1953, p. 695-697.

Used in packaging. Aniline- and o-anisidine-trinitro-benzene were used successfully in vinyl films. Tables. 11 ref.

22* Effet of Subcutaneous Implantation of Antibiotic Pellets on the Growth and Survival of Suckling Pigs. S. W. Terrill, D. E. Becker, D. I. Gard, and J. W. Lassiter. *Antibiotics & Chemotherapy*, v. 3, Oct. 1953, p. 1011-1014.

Use of antibiotic implants, with or without antibiotic-fortified rations, showed no significant physiological change in 579 test animals. Tables. 7 ref.

23* Sampling Soils for Chemical Tests. J. F. Reed. *Better Crops With Plant Food*, v. 37, Oct. 1953, p. 13-18, 47-50.

Outlines above, including composite samples, tools, and techniques. Photographs, diagrams. 14 ref.

24* A Method for Comparing Fly-Repellant Sprays. M. J. R. Healy. *Biometrics*, v. 9, Sept. 1953, p. 290-294.

Includes tables.

25* Studies on the Nature of Fungicidal Actions. II. Chemical Constitution of Benzenoid and Quinonoid Compounds in Relation to Fungitoxicity and Inhibition of Amino- and Sulfhydryl-Dependent Enzymes. Robert G. Owens. *Boyce Thompson Institute, Contributions*, v. 17, July-Sept. 1953, p. 273-282.

Variation in actions of 27 compounds on 2 amylases are reported. Substitution with Cl atoms increased inhibition. Tables. 9 ref.

26* The Use of a Diffusion Chamber as a Measure of the Rate of Oxygen Supplied by a Soil. R. R. Bruce and L. R. Webber. *Canadian Journal of Agricultural Science*, v. 33, Sept.-Oct. 1953, p. 430-436.

Describes experimental procedure and discusses results. Data indicate that temperature and moisture content affect rate of oxygen diffusion. Tables, graphs. 7 ref.

27 Laboratory Studies on Insect Repellency. L. A. O. Roadhouse. *Canadian Journal of Zoology*, v. 31, Oct. 1953, p. 535-546.

Reports tests conducted to ascertain effectiveness of typical molecular groups as repellents on human skin. Tables. 6 ref.

28 Counting More Chickens. *Chemical Week*, v. 73, Oct. 10, 1953, p. 38-40.

Describes improvement in poultry production resulting from use of antibiotics and growth stimulants. Photographs.

29 Insect Population Balance and Chemical Control of Pests. A. M. Massee. *Chemistry & Industry*, 1953, no. 39, Sept., p. 1004-1005.

Reviews causes of fluctuations in orchard fauna.

30 Insect Population Balance and Chemical Control of Pests. Predators of the Fruit Tree Red Spider Mite. Elsie Collyer. *Chemistry & Industry*, 1953, no. 40, Oct., p. 1044-1046.

31* Soil Conditioners. What Have We Learned Since '51? *Crops & Soils*, v. 6, Oct. 1953, p. 10-11, 28.

Clarifies confused concepts of what soil conditioners can and cannot do. Photographs.

32* The Responses of Sugar-Cane to Fertilizers in Trinidad. G. E. Hodnett. *Empire Journal of Experimental Agriculture*, v. 21, no. 83, July 1953, p. 204-216.

Discusses mean standard responses to nitrogen phosphate, potash, pen manure, and sugar mill by-products. Tables. 5 ref.

33 The History of the Fertiliser Industry in Britain. W. G. T. Packard. *Fertiliser Society, Proceedings no.* 19, 1952, 42 p. (S631 F41p)

Presents history of different fertilizers and manufacturing techniques. Photographs.

34 The Manufacture of Triple Superphosphate. J. J. Porter and J. Frisken. *Fertiliser Society, Proceedings* no. 21, 1953, 38 p. (S631 F41p)

Discusses history of manufacture, chemical reaction between H_3PO_4 and phosphate rock, general methods of manufacture, and some economic aspects. Photographs, diagrams.

35 Potash Mining and Production. L. Gares. **Potash Utilization in Agriculture.** G. A. Cowie. *Fertiliser Society, Proceedings no.* 22, 1953, 47 p. (S631 F41p)

First article describes mining and processing of potash in France. The second discusses the agronomic aspects of the use of potash as a fertilizer. Photographs, diagrams.

36 Some Laboratory Experiments on Resistance of the Pomace Fly to DDT Poisoning. Philip W. Berg. *Indiana Academy of Science, Proceedings*, v. 62, 1952, p. 211-216.

Includes tables. 2 ref.

37* Tracer Studies. Insecticides, Preparation of Carbon-14 Labeled DDT. George W. Pearce and Jens A. Jensen. *Journal of Agricultural and Food Chemistry*, v. 1, Sept. 2, 1953, p. 776-778.

Describes synthesis process. Diagrams. 9 ref.

38* Systemic Insecticides. *Journal of Agricultural and Food Chemistry*, v. 1, Sept. 30, 1953, p. 880-889.

A symposium including "Development of Organic Phosphates as Systemic Insecticides", Robert J. Geary; "Metabolism and Mode of Action of Schradan", John E. Casida and Mark A. Stahmann; and "Heterocyclic Carbamates Having Systemic Insecticidal Action", G. R. Ferguson and C. C. Alexander.

39* Effects of Diet and Antibiotics on Utilization of Nonprotein Nitrogen. J. M. Prescott. *Journal of Agricultural and Food Chemistry*, v. 1, Sept. 30, 1953, p. 894-896.

Addition of aureomycin, terramycin, bacitracin, or penicillin caused definite reduction in the utilization of nonprotein nitrogen, the extent of reduction being a function of antibiotic concentration. Tables. 21 ref.

40* Growth Regulators. Effect of 2,4-D on Growth and Yield of Cotton. Ernest A. Epps, Jr. *Journal of Agricultural and Food Chemistry*, v. 1, Oct. 28, 1953, p. 1009-1010.

Shows that 2,4-D reduces cotton and cottonseed oil yields when applied at early stages of plant growth. Table. 5 ref.

41 Urea-Formaldehyde Resin as a Vehicle for Semi-Permanent Insecticidal and Fungicidal Coatings on Bookbindings and Bookcases. P. Bracey and F. Barlow. *Journal of Documentation*, v. 9, Sept. 1953, p. 157-168.

Describes results of using above vehicle with pentachlorophenol, DDT, γ-BHC, and other agents. Successful formulas are given for several pests. Photographs, table. 11 ref.

42* Antibiotics, Methionine and Unidentified Growth Factors in the Nutrition of Broadbreasted Bronze Turkey Poults. R. L. Atkinson, B. L. Reid, J. H. Quisenberry, and J. R. Couch. *Journal of Nutrition*, v. 51, Sept. 10, 1953, p. 53-64.

Experiments showed antibiotics stimulated growth of turkey poults. Tables. 25 ref.

43* Sodium as a Plant Nutrient. J. J. Lehr. *Journal of the Science of Food and Agriculture*, v. 4, Oct. 1953, p. 460-471.

Shows that sodium can replace potassium in some crops, that both are necessary in some, and that potassium only is essential in others. Photographs, graphs, tables. 25 ref.

44 Effects of Tobacco-Etch Virus on Peppers (Capsicum SP.) W. H. Greenleaf. *Phytopathology*, v. 43, Oct. 1953, p. 564-570.

Reports that a severe strain of this virus was the cause of a wilt disease of Tabasco pepper. Tables, photographs.

45* Distribution, Symptoms and Control of Some of the More Important Plant Diseases. *Plant Disease Reporter*, suppl. 221, Oct. 1953, p. 107-181.

Presents compilation giving distribution, symptoms, and control of diseases of cereal crops, fiber crops, ornamentals, shade trees, special crops, rubber, sugar, tobacco, vegetables, forage legumes, grasses, and fruits.

46* Influence of Nitrogen Fertilizer on Vitamin C Content. (Russian.) A. A. Anisimov. *Sad i Ogorod*, 1953, no. 6, June, p. 41-43.

Describes experiments with onion, cabbage, garden peppergrass, and peas. Tables.

47* Role of Microelements in the Increase of Resistance of Apple Trees to Black Cancer Disease. (Russian.) E. G. Landar. *Sad i Ogorod*, 1953, no. 8, Aug., p. 19-21.

Recommends use of small amounts of B, Mn, and Mg in fertilizers. Tables.

48 Inactivating Medium for Hexachlorophene (G-11) Types of Compounds and Some Substituted Phenolic Disinfectants. A. A. Erlandson, Jr., and C. A. Lawrence. *Science*, v. 118, Sept. 4, 1953, p. 274-276.

Includes tables.

49 The Resolution and Fungistatic Action of 1,4-Cyclohexanediol bis (bromoacetate). Joseph L. LaRocca, John M. Leonard, and Warren E. Weaver. *Science*, v. 118, Sept. 4, 1953, p. 278-279.

Includes table.

50 Excretion of Heptachlor Epoxide in Milk of a Dairy Cow Fed Heptachlor. Bernard Davidow, Jack L. Radomski, and Ray Ely. *Science*, v. 118, Oct. 2, 1953, p. 383-384.

Shows that cattle behave as do dogs and rats with this new insecticide. Graphs. 4 ref.

51 Secondary Galls and Other Plant Growth-Modifying Effects Induced by Translocated α-Methoxyphenylacetic Acid. John W. Mitchell and William H. Preston, Jr. *Science*, v. 118, Oct. 30, 1953, p. 518-519.

The substituted methoxy group was found to be more active in causing secondary gall growth than phenylacetic acid. Photographs. 5 ref.

52* Radioactive Tracers in Insecticide Research. II. Paul A. Dahm. *Soap and Sanitary Chemicals*, v. 29, Oct. 1953, p. 148-149, 151, 153, 163, 165.

Reviews the more significant research findings using halogenated hydrocarbon insecticides. Tables, diagram. 41 ref. (To be continued.)

53* Cobalt Status of New Jersey Soils and Forage Plants and Factors Affecting the Cobalt Content of Plants. A. Clyde Hill, Stephen J. Toth, and Firman E. Bear. *Soil Science*, v. 4, v. 76, Oct. 1953, p. 273-284.

Includes tables, photograph. 10 ref.

54* Fertilizer Studies With Tobacco Plants Using Radiophosphorus-Labelled Superphosphate. III. H. L. Pearse and L. H. Stein. *South African Chemical Institute, Journal*, new. ser., v. 6, no. 2, Sept. 1953, p. 25-30.

Studies were made on 2 types of soils. A single application of fertilizer gave better results than the same amount applied in successive dressings. Tables.

55* Organic Phosphorus Compounds for Insecticides. (Russian.) N. N. Mel'nikov. *Uspekhi Khimii*, v. 22, no. 3, Mar. 1953, p. 253-278.

Discusses possibilities of supplementing or even replacing DDT. Tables. 266 ref.

56* A Five-Year Potted-Plant Experiment With Grass, with Soft-Earth Rock Phosphate on Mineral Soil. (German.) Ed. Hofman and A. Amberger. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde*, v. 62, no. 3, 1953, p. 210-214.

Reports on experiments comparing the effect of 2 rock phosphates with basic Bessemer phosphate and monocalcium phosphate. The investigation was done on acid mineral soil with and without lime. Tables.

57* Investigations on Organically Bound Carbon in Agriculturally Used Soils. (German.) W. Sauerlandt and E. Groetzner. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde*, v. 62, no. 3, 1953, p. 214-229.

Reports on investigations based on an analytical chemical method and on the determination of organically bound decomposition products of the roots as well as the organic secretion of the roots. Tables. 11 ref.

58* Differences in the Yield of Spinach Produced by Mineral Fertilizers Containing Chloride or Sulfate. (German.) Walter Grütz. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde*, v. 62, no. 3, 1953, p. 239-243.

Describes long-term field experiments. Tables.

See also:
254 (organic insecto-fungcides)

3. BIOCHEMICAL AND BIOPHYSICAL RESEARCH

59* Synthetic High Molecular Weight Enzyme Inhibitors. I. Polymeric Phosphates of Phloretin and Related Compounds. II. Polymeric Phosphates of Aromatic Hydroxy and Amino Compounds. (English.) E. Diczfalusy, O. Fernö, H. Fex, B. Höberg, T. Linderot, and Th. Rosenberg. *Acta Chemica Scandinavica*, v. 7, no. 6, 1953, p. 913-927.

Describes preparation. Shows high inhibitory effect on several enzymes. Tables, graphs. 15 ref.

60* Studies of Growth Factors for *Streptococcus faecalis* Occurring in Marine Algae. (English.) L. E. Ericson. E. Widoff, and Z. G. Banhidi. *Acta Chemica Scandinavica*, v. 7, no. 6, 1953, p. 974-979.

Aqueous extracts of the algae were shown to contain at least 9 factors stimulating growth. Tables. 11 ref.

61* Antibacterial Activity of a Series of Diphenylmethanes. H. J. Florestano and M. E. Bahler. *American Pharmaceutical Association, Journal, (Scientific Ed.)*, v. 42, Sept. 1953, p. 576-578.

Includes table. 16 ref.

3. *Biochemical and Biophysical Research*

62* The Structure and Behavior of Fungus Nuclei. Lindsay S. Olive. *Botanical Review*, v. 19, Oct.-Nov., 1953. p. 439-586.

Reviews investigations of nuclear cytology which have been made during the last 25 years. Diagrams. 500 ref.

63* On Proteins and Amino Acids. XV. Isolation and Some Properties of the Toxins of *Shigella Shiga-Krusae*. (Russian.) F. Sorm, Z. Sormová, P. Sebestová, and V. Matejovská. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 3, June 1953, p. 422-427.

The toxic substances were isolated by fractional precipitation with $(NH_4)_2$ SO_4 and purified by electrophoresis in agar jelly. Graphs. 15 ref.

64 Vitamin Assay. Rapid Spectrophotometric Determination of Vitamin B_{12} in Microbial Material. Robert A. Fisher. *Journal of Agricultural and Food Chemistry*, v. 1, Oct. 14, 1953, p. 951-953.

Describes method designed for material containing at least 5-10 micrograms B_{12} per gram of solids. Discusses greater simplicity and accuracy over other techniques. Tables, graphs. 13 ref.

65* Antibacterials and Growth. *Nutrition Reviews*, v. 11, Oct. 1953, p. 317-318.

Experiments showed that administration of antibiotics significantly decreased fecal anaerobes and caused a corresponding increase in the rate of growth of birds.

66 Progress in Photosynthesis. Eugene I. Rabinowitch. *Scientific American*, v. 189, Nov. 1953, p. 80-84.

Describes developments in knowledge of how plants harness sunlight to make food of CO_2 and H_2O.

67* Preparation of Monoiodotyrosine. (German.) Anneliese Hillmann-Elies and Günther Hillmann. *Zietschrift für Naturforschung*, v. 8b, no. 8, Aug. 1953, p. 446-447.

Reports identification of monoidotyrosine as intermediate by-product in the biologic synthesis of those metabolic hormones in which thyreoidin was discovered. 5 ref.

Books and Miscellaneous Publications

68 Progress in Biophysics. v. II-III. J. A. V. Butler and J. T. Randall, editors. 323 and 386 p. 1953. Acadamic Press, New York. (QH505 P94)

Each volume includes critical reviews of recent papers considered to be of lasting value.

69 Annual Review of Biochemistry. J. Murray Luck, Hubert S. Loring, and Gordon MacKinney, editors. 729 p. 1953. Annual Reviews, Inc. (QP501 A78a)

Includes papers on "Biological Oxidations", C. B. Anfinsen, Jr.; "Proteolytic Enzymes", P. Desnuelle; "Nonproteolytic, Non-oxidative Enzymes", H. M. Kalckar; "Chemistry of the Carbohydrates", R. L. Whistler; "Chemistry of Proteins, Peptides, and Amino Acids", W. L. Hughes, Jr.; "Nucleosides, Purines, and Pyrimidines", F. W. Allen; "Carbohydrate Metabolism", S. Weinhouse; "Fat-Soluble Vitamins", M. L. Quaife; "Water-Soluble Vitamins, Part I", E. L. Smith; "Water Soluble Vitamins, Part II", V. Cheldelin; "Nutrition", P. H. Phillips; "Chemistry of Neoplastic Tissue", A. C. Griffin; "Chemistry of Muscle", W. F. H. M. Mommaerts; "Biochemistry of Hormones (Restricted to Pituitary and Adrenal Interrelationships)", F. G. Young; "Clinical Biochemistry", E. J. King and I. D. P. Wooton; "Mineral Metabolism (Animals)", J. K. Loosli and G. K. Davis; "Iodine Metabolism", J. Roche; and "Metabolic Antagonists", R. O. Roblin, Jr.

70 The Enzymes. v. II, pt. II. James B. Summer and Karl Myrbäck, editors. p. 791-1440. 1952. Academic Press, New York. (QP601 S67e)

Includes chapters on "Bacterial Fermentation", S. R. Elsden; "Enzymes in Detoxication", Frederick Bernheim; "Urea Synthesis", H. A. Krebs; "Peptide Bond Synthesis", Philip P. Cohen; "Emzymatic Synthesis of Glutamine", Philip P. Cohen; "Synthesis of Acetylcholine. Choline Acetylase", Klas-Hertil; "Oxidative Assimilation by Microorganisms", C. E. Clifton; "Enzymatic Mechanisms of Carbon Dioxide Fixation", Severo Ochoa; "Carbohydrate-Fat Conversion", F. L. Breusch; "Photosynthesis in Green Plants", Walter E. Loomis; "Bacterial Photosynthesis", C. B. Van Niel; "Nitrogen Assimilation", Artturi I. Virtanen and Niilo Rautanen; "Tumor Enzymology", Jesse P. Greenstein and Alton Meister; and "Enzyme Technology", A. F. Langlykke, C. V. Smythe, and D. Perlman.

71 Fractures and Joint Injuries. v. I. Reginald Watson-Jones. 4th Ed. 443 p. 1952. Williams and Wilkins Co., Baltimore. (RD101 W33f4)

Part I covers principles of fracture treatment. Part II discusses fatigue or stress, birth, and pathological fractures.

4. CERAMICS AND CONCRETE

72 Review of Ceramic Material Requirements for Nuclear Reactor Use. J. F. White. *American Ceramic Society, Bulletin*, v. 32, Sept. 1953, p. 301-305.

Describes design criteria of ceramics for fuels, moderators, controls, structural materials, and shielding in nuclear reactors. Graph, table.

73 Low-Loss Electrical Bodies From Wollastonite. William M. Jackson, II. *American Ceramic Society, Bulletin*, v. 32, Sept. 1953, p. 306-308.

Discusses body development, production methods, and firing. Tables, graph.

74 History of Optical Glass Production in the United States. III. Francis W. Glaze. *American Ceramic Society, Bulletin*, v. 32, Sept. 1953, p. 313-317.

Covers period after World War II. Graph, tables. (Concluded.)

75 Instrumentation as Applied to Tunnel Kilns. L. D. Culp. *American Ceramic Society, Bulletin*, v. 32, Oct. 15, 1953, p. 341-346.

Presents general description of above. Discusses its help in reducing refractory wear, improving kiln uniformity, raising production rates, increasing flexibility, and lowering maintenance. Diagrams, photographs.

76 A Comparison of Plastic and Ceramic Dinnerware. R. W. Cline and Edward Schramm. *American Ceramic Society, Bulletin*, v. 32, Oct. 15, 1953, p. 349-353.

Discusses above showing how each meets various tests of good dinnerware. Concludes that chinaware is far more desirable from the health standpoint. Tables, photographs. 13 ref.

77 Hydrothermal Synthesis. George W. Morey. *American Ceramic Society, Journal*, v. 36, Sept. 1953, p. 279-285.

Presents underlying theory and describes apparatus. Diagrams, graphs. 22 ref.

78 X-Ray Study of Glass Fibers. Bhupati Kumar Banerjee. *American Ceramic Society, Journal*, v. 36, Sept. 1953, p. 294-298.

Presents study of fibers of different glassforming oxides, containing small amounts of Au- Pt, or Ag-halide, to find a correlation between the diffraction bands and the glass composition. Tables, X-ray patterns. 5 ref.

79 Viscosity and Electrical Resistivity of Molten Alkali Borates. L. Shartsis, W. Capps, and S. Spinner. *American Ceramic Society, Journal*, v. 36, Oct. 1953, p. 319-326.

Gives measurements of Li_2O-B_2O_3, Na_2O-B_2O_3 and K_2-B_2O_3 systems from 600 to 1000 C. Graphs, tables, diagram.

80 Thermal Capacity of Vitreous Silica. Harold T. Smyth, Haven S. Skogen, and William B. Harsell. *American Ceramic Society, Journal*, v. 36, Oct. 1953, p. 327-328.

Compares experimental and calculated data. Graphs.

81 Uranium Oxide Phase Equilibrium Systems. I. UO_3-Al_2O_3. II. UO_2-MgO. W. A. Lambertson and M. H. Mueller. *Aemrican Ceramic Society, Journal*, v. 36, Oct. 1953, p. 329-334.

Describes methods and results. Tables, graphs, micrograph. 17 ref.

82* Failure of Concrete Under Combined Tensile and Compressive Stresses. G. M. Smith. *American Concrete Institute, Journal*, v. 25, Oct. 1953, p. 137-140; ACI Proceedings, v. 50, 1953, p. 137-140.

Presents data on above and gives simple stress-ratio equation based upon ultimate compressive strength and modulus of rupture. Shows remarkable correlation with experimental data for various combinations of tensile and compressive stresses.

83 Thermal Expansion Tests on Aggregates, Neat Cements, and Concretes. *American Society for Testing Materials, Preprint* no. 78, 1953, 13 p. (TA401 Am35p)

Describes apparatus and discusses test data. Tables, graphs, photographs. 13 ref.

84 Significance of Tests for Chemical Reactions of Aggregates in Concrete. William Lerch. *American Society for Testing Materials, Preprint* no. 83, 1953, 12 p. (TA401 Am35p)

Describes tests to determine beneficial and deleterious chemical reactions. Graphs. 45 ref.

85 An Investigation of Cemented Tungsten Carbide as Bearing Material. J. S. Kozacks, H. A. Erickson, H. W. Highriter, and A. R. Gabriel. *ASME, Transactions*, v. 75, Oct. 1953, p. 1203-1209.

Reports performance of bearings with different lubricating oils under varying conditions.

86* Lead In Decorative Glass. (German.) H. Haffner and A. Pawletta. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 8, Aug. 1953, p. 179-185.

Discusses toxicity of Pb salts and Pb losses from repeated leaching. Graph.

87* Diamond Powder as an Industrial Product. (German.) P. Grodzinski and R. E. Leeds. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 9, Sept. 1953, p. 197-204.

Discusses grain size and uses in grinding and polishing glass and ceramic ware. Photographs, graphs, tables. 38 ref.

88* Structural Analysis of Ceramic Substances by Electron Microscopy. I. H. Pfisterer. *Berichte der deutschen keramischen Gesellschaft*, v. 30, no. 9, Sept. 1953, p. 216-220.

Describes triafol-SiO-impression process for rough porcelain surfaces. Micrographs. 12 ref.

89 Full Use Is Made of Mechanization in Manufacture of Silica Refractories. *Blast Furnace and Steel Plant*, v. 41, Oct. 1953, p. 1187-1192.

Describes Windham plant, layout of equipment, and procedures. Photographs.

90* Refractory Policy and Control. G. Reginald Bashforth. *British Steelmaker*, v. 19, Oct. 1953, p. 586-594.

Reviews progress made in silica, basic, and fireclay refractories for steelmaking. Discusses desirable qualifications of a steelworks refractory officer and functions which he should fulfill. Tables, photograph. 10 ref.

91* Ceramic Materials for the Construction of Engineering Parts. B. L. Majumder. *Ceramics*, v. 5, Sept. 1953, p. 314-320.

Discusses uses of cermets and refractory oxides in high-temperature applications where alloys and metals fail in service. Tables, graphs. 36 ref.

92* Carbon and Graphite for Chemical Plant. A. W. Morrison, B. W. Freedman, and P. G. R. Haines. *Chemical & Process Engineering*, v. 34, Oct. 1953, p. 315-320.

Describes manufacture and properties of carbon and graphite and equipment made of these materials such as heat exchanges, packed towers, pumps, and ejectors. Shows how corrosion resistance makes possible wide range of special duties in chemical industries. Photographs, tables, graphs, diagrams. 8 ref.

93* Nature of Exothermic Effect of Kaolin. (Russian.) V. I. Lebedev. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 335-338.

Discusses above on the basis of chemical, physico-chemical, thermic, X-ray, and electron microscope studies. 16 ref.

94* Physical and Chemical Aspects of the Composition of Glass. Elmar Umblia. *Glass*, v. 30, Oct. 1953, p. 461-465.

Formulas exist for predicting change in glass properties with change in composition and now data are available to predict structural changes. Tables, diagrams. (To be concluded.)

95 Techniques in the Installation of Castable Refractories. E. C. Petrie. *Industrial Heating*, v. 20, Oct. 1953, p. 2049-2050, 2052, 2054, 2056.

Discusses applications, water additions, and "drying out" and "burning in" procedures. Tables.

96 Cast Refractories Lower Heat Treat Furnace Costs. T. F. Keegan. *Iron Age*, v. 172, Oct. 22, 1953, p. 113-115.

Discusses advantages of cast refractories over conventional types after eight months operating experience at Lansing Drop Forge Co. Photographs.

97 Metal-Ceramic Wall. Lengthens Thermocouple Life. P. B. McSherry. *Iron Age*, v. 172, Oct. 29, 1953, p. 100-101.

Describes composition of new protective tubes and characteristics imparted by each ingredient. Photographs, diagrams.

98* Temperature Shrinkage Deformations in Massive Concrete Blocks. (Russian.) A. A. Gvozdev. *Izvestiia Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, 1953, no. 4, Apr. p. 493-504.

Presents formulas for stress calculation. Tables, graphs. 20 ref.

99 Measurement of the Heat of Activation for Sodium Ion Diffusion in Glass. R. Kamel. *Journal of Applied Physics*, v. 24, Oct. 1953, p. 1308-1311.

Reports observation of internal friction resulting from sodium ion diffusion in three kinds of soda glasses in the temperature range 100 to 200 C for transverse and torsional frequencies between 20 to 400 cycles per second. Diagrams, graphs, tables. 11 ref.

100 Phase Equilibria in the System MgO-TiO_2. L. W. Coughanour and V. A. DeProsse. *Journal of Research, National Bureau of Standards*, v. 51, Aug. 1953, p. 85-88.

Shows 3 binary compounds were found. Diagrams, table. 7 ref.

101* Mineralogical Calculation of Basic Refractory Materials. (Hungarian.) Cser Arisztid. *Kohaszáti Lapok*, v. 8, no. 7, July 1953, p. 162-164.

Reports on a new method developed in the course of research done on basic refractory materials in order to replace failing imports in Hungary. Method is based on equilibrium diagrams used in the cement industry, and was checked by data from literature and research. Tables. (To be continued.)

102 Recent Developments in Aerated Concrete. *Machinery Lloyd (Overseas Ed.)*, v. 25, Oct. 10, 1953, p. 87-95.

Describes advantages over Portland cement concrete. Discusses "aerocem" process and shows how method is being applied to solution of some difficult engineering problems. Photographs.

103 Carbon in the Engineering and Metallurgical Industries. II. Industrial Carbons. V. S. Kingswood. *Metallurgia*, v. 48, no. 287, Sept. 1953, p. 133-138.

Describes production of industrial carbons and typical applications. Tables, photographs, graph, diagram. 6 ref.

104* Refractory Concrete. (French.) J.-E. Lafon. *Métallurgie et la construction mécanique*, v. 85, no. 9, Sept. 1953, p. 717-721, 731.

Discusses mixtures, raw materials, and properties. Describes expansion, porosity and density, heat conductivity, mechanical and thermal resistance, and application. 5 ref.

105 Glass Processing Forges Ahead. Cylde Williams. *Monthly Business Review*, v. 35, Oct. 1953, p. 15.

Discusses highlights of developments in the glass industry.

4. *Ceramics and Concrete*

106 Control of Gas Flow Patterns in Vertical and Rotary Kilns. I. Air Flow in Relation to Fuel Steam Flow. II. Gas Flow Modifications in Rotary Equipment. Wolf G. Bauer. *Pit and Quarry*, v. 45, June 1953, p. 104-105, 116; v. 46, Oct. 1953, p. 115-116.

Uses lime manufacture as an example. Compares spiral and straight-line flow. Diagram.

107* Spalling Resistant Magnesite Refractories. (Polish.) F. Nadachowski. *Prace Instytutow Hutnictwa*, v. 5, no. 2, 1953, p. 105-112.

Describes investigations carried out on magnesite bodies containing small additions of alumina and chromite. Tables, micrographs.

108* Subsequent Determination of the Cement Content of a Concrete Sample. (German.) P. Esenwein. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 9, Sept. 1953, p. 279-283.

Presents critical evaluation of methods used to date. A new method based on a combination of the Oechsli and Florentin methods is described. Diagrams, tables. 6 ref.

109* Olivine and Forsterite. (German.) Felix Singer. *Sprechsaal*, v. 86, no. 14, July 1953, p. 342-344.

Olivine is presented as a substitute for silica sand in foundry practice. Discusses use of forsterite as a high-frequency insulator. Tables, graphs. 5 ref. (To be continued.)

110* Olivine and Forsterite. (German.) Felix Singer. *Sprechsaal*, v. 86, no. 16, Aug. 1953, p. 392-398.

Discusses physical properties of forsterite, protection against silicosis afforded by olivine sand in foundries, forsterite as electrical insulator, and olivine as a raw material in obtaining metallic Mg. Tables, diagrams, graph. 33 ref.

111* Microscopic Observations on Ceramic Products. (German.) Alphons Schoblik. *Sprechsaal*, v. 86, no. 17, Sept. 1953, p. 414-419.

Demonstrates use of the microscope for detecting flaws in ceramic ware. Photomicrographs. (To be continued.)

112* Structure Formation by Extrusion. (German.) Willi Schunk. *Sprechsaal*, v. 86, no. 17, Sept. 1953, p. 421-423.

Shows that structure of ceramic ware is often affected by molding in extrusion or vacuum presses. Mathematical method of computing applied energy and nozzle dimensions is presented. Diagrams.

113* Drying Ceramic Ware by High-Frequency Infrared Radiant Energy. (German.) *Sprechsaal*, v. 86, no. 17, Sept. 1953, p. 427-429.

Describes equipment and discusses characteristics of both methods.

114* Some Microscopic Observations on Ceramic Products. (German.) Alphons Schoblik, *Sprechsaal*, v. 86, no. 18, Sept. 1953, p. 453-457.

Discusses use of microscope to determine quality. Micrographs. (To be continued.)

115* Some Microscopic Observations on Ceramic Ware. (German.) Alphons Schoblik. *Sprechsaal*, v. 86, no. 19, Oct. 1953, p. 479-481.

Investigations of porosity were made. Micrographs. (To be continued.)

116* Some Microscopic Observations on Ceramic Products. (German.) Alphons Schoblik. *Sprechsaal*, v. 86, no. 20, Oct. 1953, p. 501-503.

Discusses causes of pin-point holes in glazes, schleiren formations, and coarse quartz in the frit. Micrographs. (To be continued.)

117* Rare Earth Metals Are Used More Frequently. (German.) Rudolf Freitag. *Sprechsaal*, v. 86, no. 20, Oct. 1953, p. 503-504.

Describes extraction, importance, and use in production of that comparable results may be obtained. Graphs, tables. 18 ref.

special optical glasses. Discusses possibilities of using salts of rare earth metals in ceramic industry.

118* Causes of Crack Formation in the Center of Unfired Brick. (Russian.) M. S. Tarasenko. *Steklo i Keramika*, v. 10, no. 4, Apr. 1953, p. 9-11.

Cracks were found to be caused by non-uniform shrinkage resulting from variations in forming pressure. Tables, graphs, photographs.

119* Electron Microscopic Investigation of the Structure of Sodium Silicates, Hydrated in Glass State. (Russian.) M. A. Matveev and A. M. Vladimirov. *Steklo i Keramika*, v. 10, no. 5, May 1953, p. 4-7.

Determines the crystal phase, crystal dimensions, and depth of crystallization process dependent upon degree of hydration. Micrographs.

120 Boron Nitrate. A. A. Giardini. *U. S. Bureau of Mines, Information Circular* 7664, Aug. 1953, 13 p. (TN21 Un3i)

Reviews major developments in boron nitride research and discusses physical and chemical properties. Diagrams. 59 ref.

121* Behavior of Kaolin During Heating. (Russian.) E. K. Keler and A. I. Leonov. *Uspekhi Khimii*, v. 22, no. 3, 1953, p. 334-354.

Examination of composition and structure of clay-forming minerals has shown that their behavior at 1000 to 1100 C is determined by the amount of constituent water in them and the distribution of hydroxyl groups in the lattice. Tables, graphs. 51 ref.

122* Kinetics of Glass Making. (Russian.) A. G. Repa. *Zhurnal Prikladnoi Khimii*, v. 26, no. 5, May 1953, p. 475-481.

Discusses simple binary Na glasses. Graphs, tables. 12 ref.

Books and Miscellaneous Publications

123 Prestressed Concrete. Kurt Gillig. 470 p. 1953. D. Van Nostrand Co., New York. (TA439 B49p)

Includes in concentrated form all information available on prestressed concrete. Discusses in detail general data, fundamentals, design, and design structure. A draft code of practice for prestressed concrete is proposed.

124 Relation of Shrinkage to Moisture Content in Concrete Masonry Units. U. S. Housing and Home Financing Agency, Housing Research Div., paper 25. 28 p. 1953. (TH1491 Un3r)

Covers the first of a series of invesitgations aimed at reduction of shrinkage cracking in concrete construction.

See also:

210 (rational analysis of clays)
265 (reactions of silicates with water)
282 (strains in enamel)
631 (expansion of refractories in carbonization chamber)
710 (thermal expansion tests of ceramic materials)
926 (hot face insulation for annealing furnaces)
1176 (thermal conductivities of MgO and urania powders)

5. CHEMICAL ENGINEERING

125* Uni- and Multi-Point Binding of Chromium Complexes by Collagen and the Problem of Cross-Linking. K. H. Gustavson. *American Leather Chemists' Association, Journal*, v. 48, Sept. 1953, p. 559-578.

Describes details and shows that cross-linking is affected by pH. Diagram, graph. 38 ref.

126* The Extraction of Wheat Germs, Milkweed Seeds, and Cottonseed by Trichloroethylene. Lionel K. Arnold, Orland R. Sweeney, and Ross F. Russell. *American Oil Chemists' Society, Journal*, v. 30, Oct. 1953, p. 393-396.

Discusses use of trichloroethylene in extraction of vegetable oils. Diagrams, graphs, tables. 11 ref.

127 Methods for the Float and Sink Analysis of Coal. R. A. Mott, chairman. *British Coke Research Association, Technical Paper no.* 3, 1952, 16 p. (TP336 B77t)

Discusses factors affecting the test and specifies methods so

128 Silicone Horizons. F. J. Quail. *Canadian Chemical Processing*, v. 37, Sept. 1953, p. 62, 64, 66, 68.

A review of manufacturing methods and properties. Photographs.

129 New Extraction Tower for Udex Ups Efficiency. *Chemical Engineering*, v. 60, Nov. 1953, p. 346, 348, 350, 352.

Describes maintenance of a constant interface level on each plate resulting in optimum efficiency.

130* Heating of Chemically Reacting Substances Between 200 and 300°. (German.) Heinrich Strombeck and Rudolf Keinke. *Chemie-Ingenieur-Technik*, v. 25, nos. 8-9, Aug. Sept. 1953, p. 447-454.

Discusses economics of working with high-pressure steam. Different heating methods are presented on a uniform basis and compared. Tables, graphs. 4 ref.

131 Some Chemical Problems Arising in the Study of Anthraquinone Dyes. S. Coffey. *Chemistry & Industry*, 1953, no. 41, Oct. 10, p. 1068-1074.

Includes tables, diagrams.

132 How Itmann Prepares "Original Pocahontas" Coal. J. H. Edwards. *Coal Age*, v. 58, Oct. 1953, p. 89-96.

Describes plant layout, equipment, and methods. Photograph, diagrams.

133* A New Desiccant for Drying Natural Gas. Activated Alumina Gel. Robert J. Getty, C. E. Lamb, and Wayne C. Montgomery. *Gas*, v. 29, Oct. 1953, p. 152, 154, 156, 160.

Discusses history, installation, test procedure, data, and results. Graphs, tables.

134* Simple Formulas to Calculate Checkerbrick Requirements. George H. Knobloch. *Gas Age*, v. 112, Oct. 22, 1953, p. 66-69.

Gives formulas which help determine number of bricks per course; total number of bricks; surface exposed to products; and void between bricks. Table.

135* Operation Oxygen. George E. H. Keillor. *Gas Journal*, v. 275, Sept. 30, 1953, p. 833-837; disc., p. 837-839.

Describes O_2 addition to fuel gas to insure oxidation of H_2S. Diagrams, tables.

136* Ammonia Synthesis. *Heat Engineering*, v. 28, July-Sept. 1953, p. 84-87.

Describes process using natural gas and air. Diagram, graph.

137 Catalytic Asphalt. Will H. Shearon, Jr. and Arnold J. Hoilberg. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2122-2132.

Describes use of P_2O_5 and $FeCl_3$ as catalysts in production of asphalt. Photographs, graphs, tables, diagrams. 27 ref.

138 Materials of Construction for Chemical Engineering. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2171-2282.

This 7th edition of the annual review contains the papers "Aluminum Alloys", Harry W. Fritts; "Carbon and Graphite", W. M. Gaylord; "Cements", C. R. Payne; "Elastomers", Harry L. Fisher; "Fibers", C. S. Grove, Jr., Joseph L. Vodonik, and Robert S. Casey; "Iron, Mild Steels, and Low-Alloy Steels", Homer L. Shaw; "Lead and Lead Alloys", Kempton H. Roll; "Nickel and High-Nickel Alloys", H. O. Teeple; "Paints", Francis Scofield; "Plastics", Raymond B. Seymour; "Stainless Steels and Other Ferrous Alloys", W. A. Luce; "Tin and Its Alloys", Robert J. Nekervis; and "Less Common Metals", Wilfred R. Bekebrede and L. F. Yntema. 1969 ref.

139 Recent Developments in Two Phase Contacting Devices. D. C. Freshwater. *Industrial Chemist and Chemical Manufacturer*, v. 29, Oct. 1953, p. 451-456.

Discusses mass transfer mechanism as applied to distillation, absorption, and extraction equipment efficiencies. Diagrams. 26 ref.

140 Blending of Coal for Carbonization, With Special Reference to Oven Coke Manufacture. G. E. Hall and G. W. Lee. *Institution of Gas Engineers, Copyright Publication* 426, 1953, 28 p. (TP700 In7.3c)

Deals with practical and theoretical aspects of coal blending as applied to coke ovens. Tables, diagrams. 24 ref.

141* Solvent Extraction of Oil Cakes of Alcohol. Y. K. Raghunatha Rao. *Journal of Scientific and Industrial Research*, v. 12, sec. A, Aug. 1953, p. 373-379.

Describes equipment and procedure for the above in both laboratory and semi-pilot-plant trials. Tables, graph, diagram.

142* Stripped Coal Gets Double Washing. *Mechanization*, v. 17, Aug. 1953, p. 85-88.

Describes raw coal handling, clean coal classifying, fine coal plant, and water supply. Diagram, photographs.

143* Dual Purpose Preparation. George C. Barnes, Jr. *Mechanization*, v. 17, Sept. 1953, p. 119-123.

Describes mechanization program, coal washing facilities, water and magnetic recovery, and coke screening plant. Tables, diagram, photographs.

144 Bay Petroleum Improves Quality, Increases Over-All Yield. G. L. Farrar and John C. Reidel. *Oil and Gas Journal*, v. 52, Sept. 28, 1953, p. 96-97, 130, 132,-133.

Describes refinery layout, equipment, and operating characteristics. Diagram, photograph.

145 Problems in Hydrocarbon Extraction. I. D. L. Katz, R. H. Schatz, and B. Williams. *Oil and Gas Journal*, v. 52, Sept. 28, 1953, p. 118, 120-121, 123.

Gives thermodynamic data for greater recovery of CH_3CH_3 and $CH_3CH_2CH_3$. Graphs, tables. (To be continued.)

146 "Fracking" a New Exploratory Tool. Philip C. Ingalls. *Oil and Gas Journal*, v. 52, Oct. 12, 1953, p. 197.

Describes hydraulic fracturing to improve oil and gas flow from wells. Diagram.

147 Five-Feld Natural-Gasoline Plant. M. R. Lents and W. S. Hudson. *Oil and Gas Journal*, v. 52, Oct. 19, 1953, p. 104-109, 115, 117, 120, 123.

Gives features of gas processing plant. Photographs, diagrams.

148 Modern Process Control at East Vealmoor. R. S. White. *Oil and Gas Journal*, v. 52, Oct. 19, 1953, p. 110-112, 115.

Describes absorber-still system and fractionation train. Diagram, photographs.

149 U. S. and Canadian Petrochem Plants. John C. Reidel. *Oil and Gas Journal*, v. 52, Oct. 26, 1953, p. 88-100.

Tabulates companies, locations, raw materials, and principal products. Tables. 18 ref.

150* New "Platformer" Plants in American and European Refineries. *Petroleum*, v. 16, no. 10, Oct. 1953, p. 279-280, 288.

Describes use of Pt catalyst to reform low-grade gasoline. Photographs.

151 Synthesis of Petrochemicals. II. Ammonia From Natural or Refinery Gases and Air. Arch L. Foster. *Petroleum Engineer*, v. 25, Sept. 1953, p. C3-C5.

Gives details of synthesis process and describes equipment. Diagram, photographs.

152 Catalytic Polyforming of Gas Oil. L. Berg, L. G. Mayfield, H. A. Saner, W. F. Polich, B. A. Ennega, R. B. Hamilton, L. D. Lewallen, and R. L. Crecelius. *Petroleum Engineer*, v, 25, Sept. 1953, p. C7-C8, C10-C11, C14-C15.

Describes equipment and methods of process. Diagram, tables. 5 ref.

153 Canada Makes Phenol, Acetone From Cumene. Harry Chapin Plummer. *Petroleum Engineer*, v. 25, Sept. 1953, p. C27-C28, C31-C32.

Describes plant layout and oxidation process. Photographs, diagrams.

5. *Chemical Engineering*

154 New "Fluid Coking" Process Boosts Domestic Fuel Yields From Residual Oils. Arch L. Foster. *Petroleum Engineer,* v. 25, Sept. 1953, p. C38.

Describes conversion of heavy residues to motor fuel, heating oil, coke, and gas. Diagram, photograph.

155 Ethylbenzene. Mother of Petrochemicals. III. Arch L. Foster. *Petroleum Engineer,* v. 25, Oct. 1953, p. C3-C4.

Taken from paper by F. R. Garner and R. L. Iverson. Describes preparation by high pressure using a silica-alumina catalyst and by low pressure using an $AlCl_3$ catalyst. Photograph.

156 Sinclair's 'Cat' Reforming Process. J. W. Teter, B. T. Borgerson, and L. H. Beckberger. *Petroleum Processing,* v. 8, Oct. 1953, p. 1519-1523.

Describes development of a new Pt reforming catalyst. "RD-150" possesses a high ratio of paraffin cyclization activity to hydrocracking activity and an ability to be regenerated with diluted air. Graphs, tables.

157 Vapor-Liquid Equilibrium Ratios. I. The General Method Applied to Binary Systems. J. M. Lenoir and G. A. White. *Petroleum Refiner,* v. 32, Oct. 1953, p. 121-123.

Describes direct method for prediction, applicable to paraffins and olefins, and accurate with pressures up to 10,000 psi a. Graphs. 47 ref.

158* Short Ball Mills for Dry-Raw and Clinker Grinding. J. M. Wolfe. *Pit and Quarry,* v. 46, Oct. 1953, p. 99-102, 122.

Describes closed-circuit grinding. Diagrams, photograph.

159* Hydrazine: New Aid to Water Treatment. Eric R. Woodward. *Power,* v. 97, Nov. 1953, p. 91-93, 212, 214, 216, 218.

Reports tests conducted to determine effectiveness as a degassing agent in boiler feedwater. Photograph, tables.

160 Mechanism of Drying. M. Coleman. *Research,* v. 6, Oct. 1953, p. 384-388.

Discusses effects of structure of the material, vapour pressure characteristics, external dyring conditions, and other factors involved. Charts. 7 ref.

161 Preparation Characteristics of Coal From Knott County, Ky. W. H. Crentz and J. W. Miller. *U. S. Bureau of Mines, Report of Investigations* 4993, Aug. 1953, 30 p. (TN21 Un3r)

Deals with upgrading the large reserves of coal remaining in Knott County, Ky. Tables, graphs, diagrams.

162* New Wash Tank Design. I. Arthur R. Williams. *World Oil,* v. 137, Sept. 1953, p. 203, 206, 208, 210, 212-213.

Describes tank construction based on a pilot chemical dehydration unit which showed that the dominant factors are temperature, chemical injection rate, and wet oil throughput rate. Graphs, diagrams.

Books and Miscellaneous Publications

163 ASTM-IP. Petroleum Measurement Tables. American Ed. 525 p. 1952. American Society for Testing Materials. (TN871 Am35p)

Contains 3 widely-used systems of measurement, all interrelated, to serve as a basis for standardized calculations of measured quantities of petroleum.

164 The Van Nostrand Chemists Dictionary. Jurgen M. Honig, Morris B. Jacobs, S. Z. Lewin, William R. Minrath, and George Murphy. 761 p. 1953. D. Van Nostrand Co. (PE1683 V33)

Covers terms extending throughout the fields of organic, inorganic, analytical, and physical chemistry, as well as industrial chemistry and chemical engineering. Includes the chemical elements, radicals, ions, and type compounds, reflecting the latest terminology in naming compounds of silicon and phosphorus. Comprises more than four thousand chemical reactions, tests, solutions, apparatus, laws, equations and industrial processes.

165 The Road to Abundance. Jacob Rosin and Max Eastman. 166 p. 1953. McGraw-Hill. (TP147 R73r)

The answer of modern chemistry to those who think the human race faces a bleak future because of the exhaustion of our natural resources.

166 The Chemistry of Synthetic Dyes. v. II. D. Venkataraman. 1442 p. 1952. Academic Press, New York. (TP913 V55c)

Contents include chemistry of intermediates and dyes, application of dyes, relation between color and chemical constitution, action of light on dyes, and chemical constitution of dyes in relation to affinity for textile fibers.

See also:
92 (carbon and graphite for chemical equipment)
103 (production of carbon blacks)
683 (gas turbines in chemical industry)
1182 (preparation of coal)
1247 (plastics for chemical equipment)

6. CHEMISTRY—ANALYTICAL AND INORGANIC

167 Polarographic Determination of Traces of Metals in Organic Material. Determination of Pb, Cu, Cd, Ni, Zn, and Fe. (English.) Erik Wahlin. *Acta Chemica Scandinavica,* v. 7, no. 6, 1953, p. 956-968.

Describes rapid method for wet combustion of cellulose, carboxymethyl cellulose, and dry yeast. Tables, graphs. 35 ref.

168 Rapid Spectrographic Determination of Small Amounts of Si in Aluminum Fluoride. (Hungarian.) Geza Szadeczky-Kardoss and Istvan Benko. *Aluminium (Budapest),* v. 5, no. 5, May 1953, p. 105-110.

Reports on the development of above method. Details of the method are described. 13 ref.

169 The Preparation and Properties of Zirconium and Hafnium Chelates of Certain β-Diketones. Edwin M. Larsen, Glenn Terry, and James Leddy. *American Chemical Society, Journal,* v. 75, Oct. 2, 1953, p. 5107-5111.

Ultraviolet spectra are presented for compounds prepared from seven diketones. Tables, graphs. 16 ref.

170* Report of the Spectroscopy Committee. 1952-1953. *American Oil Chemists' Society, Journal,* v. 30, Sept. 1953, p. 352-355.

Committee is to establish an ultraviolet spectrophotometric method for analysis of fats and oils. Samples were sent out to check precision of an earlier tentative method. Results and conclusions are presented. Tables.

171 Vacuum-Fusion Analysis of Molybdenum. M. W. Mallett and C. B. Griffith. *American Society for Metals, Preprint no.* 2, 1953, 1 1p. (TS300 Am35t)

Includes tables, diagrams, photographs.

172 The Preparation of Biological Materials for the Determination of Trace Metals. I. A Critical Review of Existing Procedures. G. Middleton and R. E. Stuckey. *Analyst,* v. 78, Sept. 1953, p. 532-542.

124 ref.

173 The Polarographic Behaviour of Some Elements in Concentrated Calcium Chloride Solution. III. The Polarography of Copper, Cadmium, Iron and Manganese. (English.) G. F. Reynolds, H. I. Shalgosky, and T. J. Webber. *Analytica Chimica Acta,* v. 9, no. 1, July 1953, p. 91-96.

The conditions of polarography are presented. Theoretical aspects of results obtained are discussed. Graph. 7 ref.

174* Polarographic Reduction of Germanium. (English.) A. K. Das Gupta and C. K. N. Nair. *Analytica Chimica Acta,* v .9, no. 3, Sept. 1953, p. 287-291.

Presents data showing 2-step reduction of tetravalent Ge under the dropping Hg electrode from ammoniacal-ammonium chloride solutions. Graphs. 4 ref.

175* Indirect Determination of Tungsten in Ores by Complexometric Titration. (French.) Arthur De Sousa. *Analytica Chimica Acta*, v. 9, no. 4, Oct. 1953, p. 309-313.

Describes method involving the precipitation of sodium tungstate with calcium chloride. 4 ref.

176 Methods for Analysis of Titanium Alloys. *Analytical Chemistry*, v. 25, Oct. 1953, p. 1432-1499.

Consists of the following papers: "Colorimetric Determination of Silicon in Titanium Alloys", Maurice Codell, Charles Clemency, and George Norwitz; "Nephelometric and Gravimetric Determination of Small Amounts of Calcium in Titanium Alloys", Maurice Codell, Allen Cherney, and George Norwitz; "Colorimetric Determination of Small Amounts of Aluminum in Titanium Alloys", Maurice Codell and George Norwitz; "Determination of Molybdenum in Molybdenum-Titanium Alloys by Precipitation as the Sulfide", George Norwitz and Maurice Codell; "Polarographic Determination of Molybdenum in Titanium Alloys", Maurice Codell, James J. Mikula, and George Norwitz; "Determination of Phosphorus in Titanium Alloys", Maurice Codell and James J. Mikula; and "Colorimetric Determination of Small Amounts of Boron in Titanium Alloys", Maurice Codell and George Norwitz.

177* Mass Spectrometric Determination of Appearance Potentials of Molecules. (German.) N. Neuert. *Angewandte Chemie*, v. 65, nos. 17-18, Sept. 1953, p. 454-461.

Discusses possibilities of formation of positive and negative ions in the disassociation of simple molecules by electronic impact. Considers processes regarding their energy balance. Graphs, diagrams, tables. 8 ref.

178 Recent Development in Electron Diffraction. T. B. Rymer. *British Journal of Applied Physics*, v. 4, Oct. 1953, p. 297-302.

Gives account of electron-optical principles of simple and high-resolution electron diffraction cameras and of combined electron microscope and diffraction camera. Shows how materials can be identified and crystalline stresses determined. Diagrams, photograph. 18 ref.

179 A New Mechanism for Persulphate Oxidations. Leonard S. Levitt. *Canadian Journal of Chemistry*, v. 31, Oct. 1953, p. 915-922.

Postulates that the persulphate ion dissociates reversibly, by means of a heterolytic cleavage, into a sulphate ion and a molecule of SO_4. Charts, tables. 12 ref.

180 Studies in Spectroscopy. IV. The Infra-Red and Ultra-Violet Spectra of Some Aliphatic Nitro-Compounds. R. N. Haszeldine. *Chemical Society, Journal*, 1953, Sept., p. 2525-2527.

Includes tables.

181 Infra-Red Absorptions of Vinyl and *iso*Propenyl Groups in Polar Compounds. W. H. T. Davison and G. R. Bates. *Chemical Society, Journal*, 1953, Sept., p. 2607-2611.

Includes tables.

182 Automatic Recording of Raman Spectra. (German.) Horst Luther and Gehard Bergmann. *Chemie-Ingenieur-Technick*, v. 25, nos. 8-9, Aug.-Sept. 1953, p. 499-504.

Discusses direct recording by use of photoelectric method. Diagram, graphs, tables, photograph. 18 ref.

183* Polarographic Study of the Kinetics of Oxidation of the Trivalent Titanium Ion by Hydroxylamine. (German.) A. Blazek and J. Koryta. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 3, June 1953, p. 326-336.

Kinetic waves were observed generating in the oxalate complex solution of tetravalent Ti in hydroxylamine. Graphs. 14 ref.

184* Polarographic Derivatives of Barbituratic Acid. II. Vernol. (German.) P. Zuman, J. Koryta, and R. Kalvoda. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 3, June 1953, p. 350-365.

The height of the wave at small concentrations is proportional to the concentration of veronal. Graphs. 15 ref.

185* Absorption by Water Vapor in the Far-Ultra Violet Region. (French.) Nicole Astoin, Andrée Johannin-Gilles, and Boris Vodar. *Comptes rendus*, v. 237, no. 11, Sept. 14, 1953, p. 558-560.

Graph. 8 ref.

186 Hydrogen Peroxide Formation in the Oxidation of Dilute Aqueous Solutions of Ferrous Sulphate by Ionizing Radiations. F. S. Dainton and H. C. Sutton. *Faraday Society, Transactions*, v. 49, Sept. 1953, p. 1011-1025.

Includes diagrams, table, graphs. 16 ref.

187 Solid Hydroxy Salts of Bivalent Metals. (German.) Walter Feitknecht. *Fortschritte der chemischen Forschung*, v. 2, no. 4, 1953, p. 670-757.

Presents basic problems of the chemistry of hydroxy salts. Discusses structural principles and relation between composition and structure. Tables, diagrams, micrographs. 150 ref.

188* New Findings With Ultrared Spectroscopy. (German.) R. Suhrmann and H. Luther. *Fortschritte der chemischen Forschung*, v. 2, no. 4, 1953, p. 758-879.

Discusses advances in measurement methods and arrangement of infrared bands for determination of constituents. Diagrams, graphs, tables. 368 ref.

189* Oxidation of Methane. (Japanese.) Masafumi Maki. *Fuel Society of Japan, Journal*, v. 32, no. 312, Apr. 1953, p. 249-252.

Formaldehyde was synthesized using air at 600 C and at atm. pressure. Various catalysts were tested. 6 ref.

190 Some Analytical Uses of 3-Dimethylaminophopylamine. Alvin W. Meibohm. *Indiana Academy of Science, Proceedings*, v. 62, 1952, p. 156-157.

Presents method of determination of Cu. 5 ref.

191 A Recording Infrared Analyzer. V. N. Smith. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 54-60.

Discusses briefly various types of non-dispersive infrared analyzers. Comparisons are made between the principal types. Graphs, photographs, tables. 15 ref.

192* Spectrochemical Determination of Small Amounts of Aluminum in Copper Alloys. (Swedish.) A. Larsson. *Jernkontorets Annaler*, v. 137, no. 6, 1953, p. 177-190.

Discusses 2 different methods. Tables. 5 ref.

193* Spectrochemical Determination of Lead in Ferro-Titanium. (Swedish.) A. Larsson. *Jernkontorets Annaler*, v. 137, no. 6, 1953, p. 191-193.

Lead in range of 0.005-0.1% was determined with accuracy of ±5%.

194* Spectrochemical Determination of Impurities in Lead. (Swedish.) A. Larsson. *Jernkontorets Annaler*, v. 137, no. 6, 1953, p. 194-196.

Lines are given for determination of Bi, Sn, Sb, and Cu.

195 Analysis With Double-Beam Infra-Red Spectrometers. L. J. Bellamy. *Journal of Applied Chemistry*, v. 3, Sept. 1953, p. 421-425.

Discusses applications and special advantages in both qualitative and quantitative work. Graphs. 8 ref.

196 Chromatography as a Class Unit in Qualitative Analysis. John G. Surak and Donald P. Schlueter. *Journal of Chemical Education*, v. 30, Sept. 1953, p. 457-459.

Present an orderly system for the above which could fit into present qualitative analysis courses. A simplified description. 27 ref.

197* Isotropic Exchange Reactions Between Bivalent and Tetravalent Lead Compounds. (French.) Antonino Fava. *Journal de chimie physique*, v. 50, no. 6, June 1953, p. 403-406.

In the system plumbite-plumbate in 7N KOH solution it was found that the exchange became measurable in vicinity of 80 C.

6. *Chemistry—Analytical and Inorganic*

198* Precipitation of Brown and Yellow Iron Oxide. III. Adsorption of Arsenic Acid. (German.) Sita Ram Gupta and Satyeshwar Ghosh. *Kolloid-Zeitschrift*, v. 132, nos. 2-3, Aug.-Sept. 1953, p. 141-143.

Discusses the amount of alkali used and rate of separation from interacting solutions affecting adsorptive capacity. Tables. 8 ref.

199* Research on Hydrated Tin Oxide. I. Precipitation by Soluble Hydroxides. (German.) N. K. Kulshrestha, A. K. Dey and S. Ghosh. *Kolloid-Zeitschrift*, v. 132, nos. 2-3, Aug.-Sept., 1953, p. 143-145.

Describes experiments to study properties, precipitation, and amphoteric behavior. Tables. 8 ref.

200 The Determination of Moisture by the Karl Fischer Method. R. E. Stuckey. *Laboratory Practice*, v. 2, Oct. 1953, p. 542-548.

Describes techniques based on above method which utilizes reaction of I_2, SO_2, and H_2O. 15 ref.

201 The Photometric Determination of Impurities in Tin. W. C. Coppins and J. W. Price. *Metallurgia*, v. 48, no. 287, Sept. 1953, p. 149-156.

Gives methods for determination of Pb, Cu, Bi, Fe, Ni, Co, Al, Zn, Cd, and S in Sn. Tables. 18 ref.

202 An Intensity-Compensating System for Infrared Spectrophotometry. H. M. Richardson, R. G. Fowler, and M. L. Coffman. *Optical Society of America, Journal*, v. 43, Oct. 1953, p. 873-876.

Describes device consisting of two sector disks rotated synchronously, with phase control on one disk permitting an absolute variation of transmission factor of compensator. Diagrams. 3 ref.

203 A New Approach to Direct Reading Spectrochemical Analysis. Richard K. Brehm and Velmer A. Fassel. *Optical Society of America, Journal*, v. 43, Oct. 1953, p. 886-889.

Discusses design and performance of instrument and indicates expected precision. Diagrams.

204* An Infrared Isotope Analyzer. (English.) J. C. Kluyver and J. M. W. Milatz. *Physica*, v. 19, no. 5, May 1953, p. 401-411.

The shift in the infrared adsorption bands of isotopic molecules was used for the determination of isotope ratios in tracer experiments. Diagrams, graphs, tables. 8 ref.

205* Determination of Aluminium and Its Nitride in Carbon Steels. (French.) M. Urbain. *Revue de Métallurgie*, v. 50, no. 9, Sept. 1953, p. 617-623.

Describes photocolorimetric method. Experimental details and results of various methods are discussed. 11 ref.

206* Direct Analysis of Steel by Means of the "Macq-Electronique" Equipment. (French.) A. Hans. *Revue universelle des mines*, v. 9, ser. 9, no. 7, July 1953, p. 428-435.

Describes apparatus and results of its use for Si and Mn determination in open-hearth and electric steels. Diagrams, tables. 6 ref.

207* Direct Analysis of Zinc and Phosphorus in Steels by Means of the "Macq-Electronique" Equipment. (French.) A. Hannick. *Revue universelle des mines*, v. 9, ser. 9, no. 7, July 1953, p. 436-441.

Discusses use for simultaneous quantitative determination of Pb, Te, Cu, and Cd in hot-dip and electrolytic Zn; and Al, Cu, and Mg in Zn alloys. Tables, photograph, graph.

208* Spectroscopic Quantitative Determination of Oxygen in Steels. (French.) B. Rosen. *Revue universelle des mines*, v. 9, ser. 9, no. 7, July 1953, p. 445-454.

Includes tables, graphs, diagrams, photographs.

209* Analysis of Iron Alloys. II. Analysis for Tungsten and Titanium. (German.) W. Meier. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 8, Aug. 1953, p. 245-249.

Describes absorptiometric method. Tables, graph, diagram. 16 ref.

210* Contribution to Rational Analysis. Separation of Dissolved Silica With Perchloric Acid Before Precipitating the Alumina. (German.) H. Seiser. *Sprechsaal*, v. 86, no. 14, July 1953, p. 337-339.

Describes improved method of analyzing clays for Al_2O_3 content.

211* The Isolation of Holocellulose From Wood. B. L. Browning and L. O. Bublitz. *Tappi*, v. 36, Oct. 1953, p. 452-458.

Gives analytical preparation of holocellulose from black spruce by chlorine-monoethanolamine method, resulting in less carbohydrate loss than than that occurring in isolation of chlorite holocellulose. Tables, diagrams, graphs. 24 ref.

212 Theoretical Consideration of Heat Transfer in the Gas-Flow Oil-Shale Retort. C. J. Mains and Arthur Matzick. *U. S. Bureau of Mines Report of Investigations* 4995, Aug. 1953, 11 p. (TN21 Un3r)

Reports method for calculating heat-transfer coefficients and temperature histories of gases and solids in the gas-flow retort operating at equilibrium conditions. Detailed calculations are presented. Graphs, diagrams.

213* Monovalent Aluminum. (Russian.) Dzh. P. Mak-Gir. *Uspekhi Khimii*, v. 22, no. 4, Apr. 1953, 499-507.

Discusses existance of a considerable number of monovalent Al compounds. Tables, graphs. 37 ref.

214 Chain Reactions in Chemistry. (Russian.) N. N. Semenov. *Uspekhi Khimii*, v. 22, no. 5, May 1953, p. 521-563.

Presents a detailed review of the development of the theory and its importance in modern chemistry. 95 ref.

215* You Can Analyze Gas in the Field. Myron L. Robinson. *World Oil*, v. 137, Sept. 1953, p. 247-249.

Taken from paper presented at Pacific Coast Gas Association, Technical Section, Los Angeles, Feb. 18-19, 1953. Describes design and advantages of Orsat combustion tube.

216* Magnetic Method of Measuring Oxygen With Highly Suppressed Zero Point. (German.) Edgar Ebbinghaus. *Zeitschrift für angewandte Physik*, v. 5, no. 8, Aug. 1953, p. 294-297.

Describes highly accurate magnetic oxygen meter. Tables, graphs, diagram. 6 ref.

217* Procedure for Determining of Chromium in Copper-Chromium Alloys. (German.) Hugo Wiedmann and Hans Nufer. *Zeitschrift für Metallkunde*, v. 44, no. 8, Aug. 1953, p. 389-390.

Presents procedure for quantitative and colorimetric processes. 2 ref.

218* Sources of Error in the Quantitative Spectrochemical Analysis of Minerals in the Carbon Arc—Their Causes and Elimination. (German.) Fr. Hegemann and A. Schöntag. *Zeitschrift für wissenschaftliche Photographie, Photophysik und Photochemie*, v. 48, nos. 7-9, 1953, p. 170-194.

Investigates numerous factors affecting results. Graphs, tables, diagrams. 10 ref.

Books and Miscellaneous Publications

219 Chemical Constitution. J. A. A. Ketelaar. 398 p. 1953. Elsevier Publishing Co., Houston. (QD501 K49c)

An introduction to the theory of chemical bond. Discusses the 4 types of bonding—ionic, atomic, metallic, and Vander Waals. Very recent results included are the chemistry of Pu and Np, cyclooctatetraene, tropolone, and theory of color.

220 Ion Exchangers in Analytical Chemistry. Olof Samuelson. 291 p. 1953. John Wiley and Sons, New York. (QD553 Sa49i)

Explains rapid and simple method of producing more reliable analytical results, finding new methods for analyzing technical

products and substances, purifying analytical reagents, recovering valuable reagents, and using ion exchangers for analytical separations.

221 Annual Reports on the Progress of Chemistry. v. 49. 429 p. 1953. Chemical Society, London. (QD1 C42a)

Includes articles on general, physical, organic, and inorganic chemistry; biochemistry; and crystallography.

222 Spectrographic Analysis of Low-Alloy Steels. BISRA Special Report no. 47. 83 p. 1952. Iron and Steel Institute, London. (TN601 I6s)

A recommended method for the spectrographic analysis of low-alloy steels has been drawn up and given extensive trials on a series of chemically analyzed standards.

See also:
64 (spectrophotometric analysis of vitamin B_{12})
298 (infrared spectroscopy of oils and resins)

7. CHEMISTRY—ORGANIC

223* On the Isomerism of Hydroxyurea. II. Preparation of the Isomers. (English.) Helmer Kofod. *Acta Chemica Scandinavica*, v. 7, no. 6, 1953, p. 938-941.

Describes improved method of preparation. Crystalline isomers were obtained in equal proportions and in overall yields of 30-50% of theoretical. Diagram, table. 6 ref.

224 Alkylation of Cyclopropyl Phenyl Ketone. Frank J. Piehl and Weldon G. Brown. *American Chemical Society, Journal*, v. 75, Oct. 20, 1953, p. 5023-5026.

Discusses lability of ring H atoms in above. Shows that condensation occurs by normal displacement of the α-H atom in benzylation or carbethoxylation. Concludes that a stable cyclopropyl-type anion forms when no alternate reaction is possible. Table. 16 ref.

225* Observations on the Determination of Iodine Value With Pyridine Sulfate Dibromide. H. J. Lips. *American Oil Chemists' Society, Journal*, v. 30, Oct. 1953, p. 399-403.

Describes determinations on oils. Iodine values tended to increase with reaction time and amount of excess reagent. Erratic values were obtained in the presence of S. Graphs, tables. 17 ref.

226* The Isolation and Characterization of the Polymers Formed During the Autoxidation of Ethyl Linoleate. S. S. Chang and F. A. Kummerow. *American Oil Chemists' Society, Journal*, v. 30, Oct. 1953, p. 403-407.

Ethyl linoleate autoxidized at 30°C for 350 hrs. was separated into fractions of increasing polarity and molecular weight by extraction with solvent pairs of "Skellysolve F" and diethyl ether. Analytical results obtained on characterization of the more polar polymer fractions indicated that the oxidative polymers of ethyl linoleate were linked through carbon to oxygen bonds rather than carbon to carbon bonds. Graphs, tables. 23 ref.

227* Toxicity Studies of a Nonionic Detergent. Kathleene M. Sweeny and Kurt A. Oster. *American Pharmaceutical Association, Journal, (Scientific Edition)*, v. 42, Sept. 1953, p. 556-560.

Presents studies of "OPGE" on rats. Tables, graphs. 8 ref.

228* Aerosol Technique for the Study of Macromolecules With the Electron Microscope. (English.) E. De Robertis, C. M. Franchi, and M. Podolsky. *Biochimica et Biophysica Acta*, v. 11, no. 4, Aug. 1953, p. 507-516.

Describes general set-up used with control experiments indicating size and distribution of the aerosol. Graph, diagram, micrographs. 19 ref.

229* The Chemistry and Petrography of Ion Exchangers From Lignite and Bituminous Coal. (German.) Hans Stach, Bergschule Aachen, and Marlies Teichmüller. *Brennstoff-Chemie*, v. 34, nos. 17-18, Sept. 1953, p. 275-281.

Discusses research for industrial purposes and as a means of studying structure of coal. Describes reactions in exchange activation and under conditions of natural carburization. Table, graph. 7 ref.

230 Reactions of Cyanogen Iodide. L. E. Bodnar and A. B. Van Cleave. *Canadian Journal of Chemistry*, v. 31, Oct. 1953, p. 923-936.

Reports investigation of a series of HCl-catalyzed reactions involving CNI in dioxane and in aqueous solution at 30° and 45°C. Graphs. 18 ref.

231 Nonionic Surface Active Agents. James L. Rainey and C. E. Denoon, Jr. *Chemical and Engineering News*, v. 31, Nov. 2, 1953, p. 4521-4523.

Discusses uses in cleaners, stabilizers, fertilizers, and therapeutics. Graphs.

232 The Oxidation of Phenylhydrazones With Perphthalic Acid. I. B. M. Lynch and K. H. Pausacker. *Chemical Society, Journal*, 1953, Sept., p. 2517-2519.

Cites experimental procedures. Tables.

233* The Bases of Mineral-Coal Tar Pitch. (German.) Rudolf Oberkobusch. *Chemische Berichte*, v. 86, no. 8, Sept. 1953, p. 975-979.

Describes experiments which revealed 4 new compounds. Tables. 7 ref.

234* The Components of Mineral-Coal Pitch. The Presence of *p*-Methyl-Styrene. (German.) Tobias Johannes Wilken Jorden and Guido Werner Perold. *Chemische Berichte*, v. 86, no. 8, Sept. 1953, p. 991-996.

Describes experiments. 13 ref.

235* Chemical Reactions at Very High Pressures. I. Isomerization of *n*-Hexane in Presence of Aluminum Chloride. M. G. Honikberg, A. E. Gawrilowa, and B. A. Kasansky. **II. Exchange Effect Between Benzol and Aluminum Chloride.** (German.) M. G. Honikberg and A. E. Gawrilowa. *Chemische Technik*, v. 5, no. 8, Aug. 1953, p. 445-446, 447.

Reports on test data. Tables.

236 Fluorocarbon Chemistry. H. G. Bryce. *Chemistry in Canada*, v. 5, Oct. 1953, p. 202-205.

Discusses properties of perfluoro compounds. Tables, graph.

237 Recent Research on Oxidation of Monoethenoid Fatty Acids and Esters. J. H. Skellon. *Chemistry & Industry*, 1953, no. 40, Oct., p. 1047-1049.

A review. 29 ref.

238* Esters of Diethylphosphinic Acid. (Russian.) B. A. Arbuzov and N. I. Rizpolozhenskii. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 291-292.

Describes synthesis and properties. Tables. 4 ref.

239* Splitting of the Ethylene Bond With Bromine in Benzylidenebindones. (Russian.) G. Vanag. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 297-299.

Describes above. Tables. 7 ref.

240* Reaction of Magnesium Alkyl Halides With Dihaloidhydrins of Two-Tertiary γ-Acetylene Glycols. (Russian.) A. D. Petrov and L. N. Lavrishcheva. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 313-316.

Discusses above. Tables. 6 ref.

241 Evaluation of Organic Fluorine Compounds for Use in Military Aireraft. Harold Rosenberg and J. C. Mosteller. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2283-2286.

Discusses uses as fire-extinguishing agents, acid-resistant coatings and greases, nonflammable hydraulic fluids, elastomers, fungicides, and electronic equipment. Tables. 6 ref.

242* Sugar Oxidation, Saccharic and Oxalic Acids by the Nitric Acid Oxidation of Dextrose. C. L. Mehltretter and C. E. Rist. *Journal of Agricultural and Food Chemistry*, v. 1, Sept. 2, 1953, p. 779-783.

Describes processes in detail. Table, graphs. 20 ref.

243 Heat Capacity, Heats of Fusion and Vaporization, and Vapor Pressure of Tetrafluoroethylene. George T. Furukawa, Robert E. McCoskey, and Martin L. Reilly. *Journal*

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of Research, National Bureau of Standards, v. 51, Aug. 1953, p. 69-72.

Tables. 14 ref.

244* The Microanalysis of Fluorine-Containing Organic Compounds. II. The Determination of Fluorine. (English.) R. Belcher, E. F. Caldas, S. J. Clark, and A. Macdonald. *Mikrochimica Acta,* 1953, no. 3, p. 283-289.

The compound is decomposed by fusion with metallic Na or K in a Ni bomb of special design. The F is titrated with $Th(NO_3)_4$ solution. Table. 11 ref.

245 Asphalt Analysis. VII. What Is Asphalt Composition? R. N. Traxler and H. E. Schweyer. *Oil and Gas Journal,* v. 52, Nov. 2, 1953, p. 133.

From a paper presented at an ACS Petroleum Division Symposium. Discusses separation of asphalt into 3 components. Table. 13 ref.

246 Petrochemical Reactions. VI. Nitration and Sulfonation of Paraffin and Aromatic Hydrocarbons. Lewis F. Hatch. *Petroleum Refiner,* v. 32, Oct. 1953, p. 129-132.

Discusses mechanisms and conditions essential for above reactions. Tables, diagrams. (To be continued.)

247* Quantative Analysis of the Condensation Products of Urea Formaldehyde. (German.) L. M. Mobers. *Plastica,* v. 6e, no. 9, Sept. 1953. p. 392-394.

Discusses importance, analytical procedure, and structural formulas. (To be continued.)

248* Tagging the Elusive Micelle. Karol J. Mysels. *Research Reviews, Office of Naval Research,* Sept. 1953, p. 15-18.

An elementary discussion. The micelle is tagged internally with a dye molecule and its behavior observed during electrophoresis.

249* Perfuming Aerosols. Herbert Kainik. *Soap and Sanitary Chemicals,* v. 29, Oct. 1953, p. 45-48.

Discusses problems, testing, and applications in lacquers and sprays. Photographs, tables.

250 Hydrocarbon and Nonhydrocarbon Derivatives of Cyclopropane. Vernon A. Slabey, Paul H. Wise, and Louis C. Gibbons. *U. S. National Advisory Committee for Aeronautics, Report* 1112, 1953, 18 p. (TL521 Un3r)

Discusses methods used to prepare and purify 19 hydrocarbon derivatives. Melting points, boiling points, refractive indices, densities, and heats of combustion were determined. Tables, graphs, diagrams. 57 ref.

251* 2-Iodo-Estrone and 2-Iodo-Estradiol. (German.) Anneliese Hillmann-Elies, Günther Hillmann, and Ulrich Schiedt. *Zeitschrift für Naturforschung,* v. 8b, no. 8, Aug. 1953, p. 436-440.

Discusses iodizing esteone and estradiol with iodomercuric acetate in glacial acetic acid. Graphs. 12 ref.

252* Electronographic Study of Polymeric Hydrocarbons. Polyethylene. (Russian.) E. E. Rylov, V. L. Karpov, and V. A. Kargin. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 4, Apr. 1953, p. 572-578.

Classifies stretching mechanism of crystal polymers. Tables, graphs, micrographs. 3 ref.

253* Structure and Nature of Complex Compounds Formed During the Reaction of Iodine Halides With the Halides of Potassium or Aluminum. (Russian.) Ia. A. Fialkov and O. I. Shor. *Zhurnal Obshchei Khimii,* v. 23, no. 3, Mar. 1953, p. 363-372.

Tables. 15 ref.

254* From the Field of Organic Insecto-Fungicides. XII. Synthesis of Mixed Esters of Phosphoric and Thiophosphoric Acids. XIII. Synethsis of Mixed Esters of Phosphoric and Thiophosphoric Acids Containing the Simplest Substitutes in the Aliphatic Radicals. (Russian.) M. L. Galashina, Ia. A. Mandel'baum, I. L. Valdimirova, and N. N. Mel'nikov. *Zhurnal Obshchei Khimii,* v. 23, no. 3, Mar. 1953, p. 429-435.

Tables. 31 ref.

255* Physicochemical Analysis of Binary Systems Formed by Urea With Aliphatic Acids. (Russian.) N. Z. Rudenko and D. E. Dionis'ev. *Zhurnal Obshchei Khimii,* v. 23, no. 5, May 1953, p. 721-725.

Discusses reactions between urea and acetic, butyric, and chloracetic acids in liquid phase. Graphs. 7 ref.

256* Interaction of Hydrogen Sulfide With Oxides of the Acetylene and Vinyl-Acetylene-Series. (Russian.) F. Ia. Perveev and N. I. Kudriashova. *Zhurnal Obshchei Khimii,* v. 23, no. 6, June 1953, p. 976-980.

Table. 14 ref.

Books and Miscellaneous Publications

257 Physical Constants of Hydrocarbons. v. V. ACS Monograph Series. Gustav Egloff. 524 p. 1953. Reinhold Publishing Co., New York. (QD291 Eg58p)

Covers new techniques which have facilitated the identification of less common hydrocarbons and cleared up much confusion which formerly existed concerning their constitution.

258 Structure and Mechanism in Organic Chemistry. C. K. Ingold. 828 p. 1953. Cornell Univ. Press, Ithaca, N. Y. (QD476 In4s)

Includes chapters on "Valency and Molecular Structure"; "Interactions Between and Within Molecules"; "Physical Properties of Molecules"; "The Aromatic Nucleus"; "Classification of Reagents and Reactions"; "Electrophilic Aromatic Substitution"; "Nucleophilic Aliphatic Substitution"; "Olefin-Forming Elininations"; "Saturated Rearrangements"; "Unsaturated Rearrangements"; "Aromatic Rearrangements"; "Additions and Their Retrogression"; "Acids and Bases"; "Carboxyl Reactions"; and "Nucleophilic Aromatic Substitution".

259 Formaldehyde. J. Frederick Walker. 2nd Ed. 575 p. 1953. Reinhold Publishing Corp. (QD305.A6 Wi5f2)

The numerous advances in formaldehyde chemistry and technology are covered in detail. Separate chapters deal with latest known reactions of formaldehyde with various types of chemical compounds.

260 Estimation of Organic Compounds. F. Wild. 239 p. 1953. Cambridge Univ. Press, London. (QD271 W64e)

Includes chapters covering the following compounds and groupings: olefines, alcohols, enols, phenols, mercaptans, aldehydes and ketones, acetyl, benzoyl, methoxyl, ethoxyl, propoxyl, butoxyl, methylimino, ethylimino, methyl and ethyl groups attached to sulphur, the methyl group attached to carbon, amines and amino compounds, nitro, nitroso, cyano, and isocyanates and isothio cyanates.

261 Organic Syntheses. v. 33. Charles C. Price, editor. 115 p. 1953. John Wiley and Sons, Inc. (QC262 Or3s)

Procedures for the preparation of compounds which are of general interest or which illustrate useful synthetic methods.

262 Silicone Products. Chemical Div., General Electric. Unpaged. 1953. (QD412.S6 G28s)

Covers product data and prices on silicone chemicals, elastomers, fluids, emulsions, resins, and specialities.

8. CHEMISTRY—PHYSICAL

263 The Physics of Long-Chain Crystals. Vera Daniel. *Advances in Physics,* v. 2, Oct. 1953, p. 450-494.

Discusses long-chain molecules and forces bonding them into crystals. Shows how structural features lead to different observed order-disorder phenomena. Diagrams, tables, graphs, photographs. 58 ref.

264* Change of Reducibility of Metallic Compounds by the Addition of Metals or Metallic Compounds. (German.) N. G. Schmahl. *Angewandte Chemie,* v. 65, nos. 17-18, Sept. 1953, p. 447-453.

Particle size effects were explained by use of activity concept and law of mass action. Graphs. 28 ref.

265 The Reaction Between Water and Vitreous Silicates. I. R. Beattie. *Faraday Society, Transactions,* v. 49, Sept. 1953, p. 1059-1065.

Reports experiments which show that the rate-controlling process is probably migration of Na ions through the glass. Table, diagram, graphs. 15 ref.

266 Hydrothermal Preparation of Some Strontium Silicates. Elmer T. Carlson and Lansing S. Wells. *Journal of Research, National Bureau of Standards,* v. 51, Aug. 1953, p. 73-80.

Details preparation of 7 Sr silicates. X-ray powder patterns and some optical data are given. Micrographs, tables. 9 ref.

267* Apparatus for Study of Electrode Behavior in Electrolytic Cells. (Italian.) C. Guerci, G. Tagliaferri and L. Terra. *Nuovo cimento,* v. 10, ser. 9, no. 7, July 1953, p. 971-983.

Describes an electronic circuit which improves performance and reliability. Diagrams.

268* An Investigation as to the Type of Particles Occurring in Concentrated Solutions of Electrolytes in Relation to the Hydration of the Ions. (English.) B. H. Van Ruyven. *Recueil des travaux chimiques des Pays-Bas,* v. 72, no. 8, Aug. 1953, p. 739-762.

Discusses the behavior of concentrated electrolytic solutions. Tables, graphs.

269* Adsorption in Measuring the Surface Area of Porous Bodies. (Italian.) G. Salvi and A. Fiumara. *Rivista dei Combustibili,* v. 7, no. 6, June 1953, p. 346-391.

Discusses theoretical principles governing adsorption phenomena and applications to the determination of surface area of porous substances. Diagrams, graphs, tables. 44 ref.

270 Vapor Pressures of Concentrated Nitric Acid Solutions in the Composition Range 83 to 97 Percent Nitric Acid, 0 to 6 Percent Nitrogen Dioxide, 0 to 15 Percent Water, and in the Temperature Range 20° to 80°C. A. B. McKeown and Frank E. Belles. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53G08, Sept. 17, 1953, 22 p. (TL782 Un3rm)

Discusses measurement of total vapor pressure of 28 acid mixtures of the system HNO_3-NO_2-H_2O. Tables, graphs, diagram. 10 ref.

271* Recent Dipole-Moment Measurements and a Report on Influence of Solutions. (German.) G. Klages and E. Klöpping. *Zeitschrift für Elektrochemie,* v. 57, no. 5, June 1953, p. 369-373.

Discusses experimental data for various compounds and solvents. Tables. 25 ref.

272* Polarization of Lattice Structure. (German.) W. Lorenz. *Zeitschrift für Elektrochemie,* v. 57, no. 5, June 1953, p. 382-385.

Evaluates polarization as it occurs in metal electrodes as a result of change of activity in the typical adsorption layer during current flow. Graph, table. 10 ref.

273* Heats of Formation in the Aluminum-Magnesium System. (German.) Franz Eberhard Wittig and Georg Piller. *Zeitschrift für Metallkunde,* v. 44, no. 9, Sept. 1953, p. 431-435.

Describes procedures of determining the above. Also describes experiments with a solution colorimeter to determine the heats of solution of Al and Mg and their alloys in HCl. Diagrams, graph, tables. 25 ref.

274* The Effect of External Magnetic Fields on the Activity of Ferromagnetic Catalysts. I. External Magneto-Catalytic Effect. (German.) E. Justi and G. Vieth. *Zeitschrift für Naturforschung,* v. 8a, no. 9, Sept. 1953, p. 538-546.

Describes experiments ascertaining that internal Hedvall effects are correlated to ferromagnetic and paramagnetic states of matter. Graphs, diagrams. 18 ref.

275* Adsorption of Substances Which Change Surface Tension and Course of Electrochemical Reaction. (Russian.) A. P. Martirosian and T. A. Kriukova. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 6, June 1953, p. 851-864.

Discusses role of foreign electrolyte. Graphs, tables. 29 ref.

Books and Miscellaneous Publications

276 Vapor-Liquid Equilibrium in the Binary System Hydrazine and Water. R. Q. Wilson, H. P. Munger, and J. W. Clegg. Paper from PHASE-EQUILIBRIA, p. 115-117. 1952. Amer. Inst. Chem. Engrs., New York. (QD501 Am35p)

Vapor-liquid compositions for the binary system hydrazine-water were determined at atmospheric pressure. The maximum boiling azeotrope boiled at 120.1 C., and had a composition of 58.5 mole % hydrazine. The compositions were determined at 25 points, on both sides of the azetrope.

277 Annual Review of Physical Chemistry. v. IV. G. K. Rollefson and R. E. Powel, editors. 493 p. 1953. Annual Reviews, Inc., Stanford, Calif. (QD453 R64a)

Includes chapters on "Thermochemistry and the Thermodynamic Properties of Substances", J. W. Stout; "Heterogeneous Equilibria and Phase Diagrams", R. H. Bogue and T. F. Newkirk; "Solutions of Electrolytes", R. M. Fuoss and A. S. Fuoss; "Solutions of Nonelectrolytes", S. E. Wood; "Isotopes", H. G. Thode; "Radioactivity and Nuclear Theory", A. Turkevich; "Radiation Chemistry", J. Weiss; "Quantum Theory, Theory of Molecular Structure and Valence", J. Lennard-Jones; "Spectroscopy", G. B. B. M. Sutherland; "Co-operative Aspects of Phase Transitions", B. H. Zimm, R. A. Oriani, and J. D. Hoffman; "Experimental Molecular Structures", S. H. Bauer and P. Anderson; "Experimental Crystallography", W. N. Lipscomb; "Reaction Kinetics", H. Taube; "Contact Catalysis and Surface Chemistry", C. Kemball; "Photochemistry," E. W. R. Steacie and F. P. Lossing; "Physical Properties of High Polymers", J. D. Ferry; "Ion Exchange", W. Juda, J. A. Marinsky, and N. W. Rosenberg; "Photosynthesis", R. Lumry, J. D. Spikes, and H. Eyring; "Microwaves and Nuclear Resonance", B. P. Dailey; and "Magnetism", P. W. Selwood.

278 Phase-Equilibria. v. II. F. J. Van Antwerpen, editor. 117 p. 1952. Amer. Inst. Chem. Engrs. New York. (QD501 Am35p)

Covers a wide variety of systems, including fluorocarbons, light gases, aqueous solutions, petroleum fractions, salts, etc. New experimental P-V-T-X and equilibrium still data are presented; solubility and vapor-liquid equilibrium relationship are reviewed; and new graphical correlations and calcuation procedures are shown.

9. COATINGS

279 Vibration of Plates Covered with a Damping Layer. (English.) A. Van Itterbeek and H. Myncke. *Acustica,* v. 3, no. 4, 1953, p. 207-212.

Discusses damping effects of a thin layer of bitumen emulsion containing schist powder or similar products on steel plates. Graphs, photographs, diagrams.

280* Problems and Testing of Paints and Lacquers on Light Metals. (German.) W. Toeldte. *Aluminium,* v. 29, no. 10, Oct. 1953, 413-416.

Discusses various problems in application and testing. 4 ref.

281* Equipment for Testing Anodic Coatings. II. (German.) *Aluminium Ranshofen, Mitteilungen,* 1953, no. 2, July, p. 34-35.

Shows that thickness and quality of anodic film can be determined by measuring dielectric strength of Al. Graph.

282 Determination of Strains Between Enamel and Iron by Means of Split Rings. J. D. Walton, Jr. and B. J. Sweo. *American Ceramic Society, Journal,* v. 36, Oct. 1953, p. 335-341.

Describes apparatus used and method of determining strains. Graphs, diagrams, photographs, tables.

283* Interior Architectural Finishes. J. MacGuffie. *American Paint Journal,* v. 37, Sept. 1953, p. 76, 78, 80, 84, 86, 88-89, 92, 94, 96-98, 100, 102.

Relationships between pigment volume concentration and properties of the product are described. Formulas, tables, diagrams.

9. *Coatings*

284 Latex Paints. W. A. Henson. *American Paint Journal*, v. 38, Oct. 12, 1953, p. 68, 70, 72, 74-76.

Describes present state of technology of the above and compares it to that of alkyds 20 years ago.

285 Latex Paints. Dorothy J. Schroeder. *American Paint Journal*, v. 38, Oct. 12, 1953, p. 80, 82, 84, 86, 88.

Describes good and bad features of polystyrene, polyvinyl acetate, and acrylic emulsions.

286 Fundamentals of Paint, Varnish, and Lacquer Technology. VII. Pigments. Elias Singer. *American Paint Journal*, v. 38, Oct. 19, 1953, p. 26-27, 30, 32, 34, 36, 38.

Discusses colored, metallic, and basic pigments including basic $PbCO_3$, basic $PbSO_4$, ZnO, and lithophone. (To be continued.)

287 Fundamentals of Paint, Varnish, and Lacquer Technology. Chap. VII. Pigments. Pt. II. Color Pigments. Elias Singer. *American Paint Journal*, v. 38, Nov. 2, 1953, p. 65-68, 70-73.

Colored and metallic pigments are discussed.

288 A Laboratory Evaluation of Ceramic Coatings for High Temperature Applications. Sara J. Ketcham. *American Society for Testing Materials, Preprint No.* 92c, 1953, 8 p. (TA401 Am35p)

Describes tests to determine resistance to thermal shock, protection against oxidation, and adherence. Gives results of tests on coated 4130 steel. Micrographs, photographs.

289 Tension Tests of Porcelain Enameled Steel. W. A. Deringer. *American Society for Testing Materials, Preprint No.* 92d, 5 p. (TA401 Am35p)

Describes investigation to study tensile properties of glass or porcelain enamel coating on steel tension specimens to determine relationship between yield point of the steel and stress and strain required to cause the porcelain enamel coating to crack. Graphs.

290 Resistance of Porcelain Enamels to Weathering. Dwight G. Moore. *American Society for Testing Materials, Preprint No.* 92e, 1953, 8 p. (TA401 Am35p)

Describes condition of test panels after 7 years of exposure and describes correlation obtained between weather resistance of the various enamels and their resistance to acid attack. Tables, graphs. 10 ref.

291 High-Temperature Ceramic Coatings as Applied to Aircraft Power Plants. B. L. Paris. *American Society for Testing Materials, Preprint No.* 92f, 1953, 8 p. (TA401 Am35p)

Presents summary of expected benefits to be derived. Properties of these coatings and the position of the industrial engineer relative to the over-all program are presented. Photographs, tables.

292 Tinting Strength of Opaque White Pigments. Louis A. Melsheimer. *ASTM Bulletin*, 1953, no. 193, p. 56-58.

Reviews existing test methods for the above. Table.

293* The Effect of Sheet Steel Quality on Vitreous Enamel Coatings. L. S. Heard. *Australasian Engineer*, 1953, Aug. 7, p. 43-47.

Presents results of tests on enamelled linings and sheet material. Micrographs, tables.

294* Some Notes on the Microstructures of Enamelled Iron Castings. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Aug. 1953, p. 15-18.

Describes 4 microspecimens and suggests reasons for occurrence of blisters. Micrographs, table.

295* The Relevance of Casting Skin to the Incidence of Blistering in Cast Iron Enamels. E. R. Evans. *British Cast Iron Research Association. Journal of Research and Development*, v. 5, Aug. 1953, p. 19-25.

Describes testing procedure, preparation of test pieces, processing plates, and results. Tables, diagrams.

296 Phosphatizing Metals Supplies Strong Bond for Organic Finishes. *Chemical and Engineering News*, v. 31, Oct. 12, 1953, p. 4242-4243.

Describes "Fosbond" process developed by Pennsylvania Salt Mfg. Co.

297 Polyvinyl Acetate Emulsion Paints. W. E. Smith. *Chemistry in Canada*, v. 5, Oct. 1953, p. 198-201.

Describes current market situation and discusses functions of ingredients.

298 The Value of Infrared Spectroscopy to the Protective Coatings Chemist. H. W. Lemon, and Elizabeth M. Kirby. *Chemistry in Canada*, v. 5, Oct. 1953, p. 212-215.

Summarizes studies of the Ontario Research Foundation in characterizing unknown resins and following resin development. Photographs, graphs.

299 Field Tests of Exterior Coatings for a Pipe Line Conveying Fuel Oil Heated to 200 Degrees F. E. R. Stauffacher and R. R. Davidson. *Corrosion*, v. 9, Oct. 1953, p. 377-381.

Recommends a 0.5-in. coating of 250 F. melting point asphalt. Describes tests. Photographs, diagrams, graphs, tables.

300 Color Control of White Appliance Finishes. H. L. Farber. *Finish*, v. 10, Sept. 1953, p. 25-27, 99.

Describes equipment and methods for color control. Photographs, graph.

301 Porcelain Enameling Metal TV Cones. J. L. McLaughlin. *Finish*, v. 10, Sept. 1953, p. 31-33, ST18.

Describes automatic spraying system. Photographs.

302 Silicone Finishes for High Temperature Applications. R. C. Hedlund. *Finish*, v. 10, Oct. 1953, p. 45-46, 107-108.

Describes ability of silicone resins to resist heat and corrosion. Photographs.

303 High Temperature Ceramic Coatings and Their Applications. *Finish*, v. 10, Nov. 1953, p. 45-47.

Describes the procedure used by the Solar Aircraft Co. in production of coated components. Photographs.

304 Gas Plating—Its Possibilities in Industry. John E. Hyler. *Finish*, v. 10, Nov. 1953, p. 48, 56, 89.

This recent rapid plating process is described and its specific advantages are cited. Photographs.

305* How We Prepare and Paint Metal Furniture. Robert J. Deisenroth. *Industrial Finishing*, v. 29, Oct. 1953, p. 30-31, 33-34, 36, 38.

Describes equipment, plant layout, and operating procedures. Photographs.

306 The Painting of Steel. J. C. Hudson. *Institute of Metal Finishing, Transactions, Advance Copy No.* 1, v. 29, 1953, 22 p. (TS670 E25j)

Possible developments in protective painting are discussed and further research suggested. Graphs, micrographs, tables. 21 ref.

307 Recent Development in Metal Spraying by the Powder Process. William McDermott. *Institute of Metal Finishing, Transactions, Advance Copy No.* 3, v. 29, 1953, 10 p. (TS670 E25j)

Describes an improved powder spraying pistol which permits application of denser, less oxidized, and better adherent coatings of Tn, Al, and other coating metals. Table, diagrams.

308 Recent Advances in Metal Spraying by the Wire Process. W. E. Ballard. *Institute of Metal Finishing, Transactions, Advance Copy No.* 4, v. 29, 1953, 8 p. (TS670 E25j)

Summarizes trends of wire spraying industry during past 5 years. Photographs. 8 ref.

309* Surface-Active Properties of Polydiene Drying Oil. (Russian.) I. I. Zabolotnyi, and A. G. Chistiakova. *Kolloidnyi Zhurnal*, v. 15, no. 3, May-June 1953, p. 195-197.

Corresponding surface-active properties between polydiene and natural linseed oils were established. Graphs, table. 8 ref.

310 Finishes for Aluminum. R. V. Vanden Berg. *Machine Design*, v. 25, Oct. 1953, p. 177-186.

Discusses applications and processes. Photographs, graphs, table, diagram.

311 Specification of Color in Finishes. Carl R. Smedley. *Machine Design*, v. 25, Oct. 1953, p. 187-192.

Discusses factors involved. Photographs, table.

312 Priming Paints for Light Alloys. J. G. Rigg and E. W. Skerrey. *Metal Industry*, v. 83, Sept. 25, 1953, p. 259-261.

Abridged article describing tests carried out on a number of light alloys to determine relative resistance of 4 types of primary pigments to varying atmospheric conditions.

313* Advances in Phosphating. (German.) H. Keller. *Metalloberfläche*, Ausgabe A, v. 7, no. 9, Sept. 1953, p. 129-136.

Presents survey of surface treatment by phosphating and similar processes. Emphasizes rapid advances being made and economic aspects. Photographs, graphs, diagram. 6 ref.

314* Questions Regarding the Painting of Metals. (German.) Heinz Anders. *Metalloberfläche*, Ausgabe A, v. 7, no. 9, Sept. 1953, p. 139-141.

Surveys organic coatings used to impart high impact strength to metals. 10 ref.

315 Hot Dip Aluminising. M. L. Hughes and D. P. Moses. *Metallurgia*, v. 48, no. 287, Sept. 1953, p. 105-122.

Describes influence on properties of steel base, gives procedures and operation of a pilot plant for continuous coating, and discusses advantages and disadvantages of process. Tables, micrographs, macrographs. 29 ref.

316* Hot Tinning. (French.) G. Haas. *Métallurgie et la construction méchanique*, v. 85, no. 8, Aug. 1953, p. 629-631.

Discusses tinning of steel.

317* Calcium Carbonate Extender Pigments in Exterior House Paints. Ray L. McCleary and Paul E. Kummer. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 345, Oct.., p. 660-694.

Reports effects of grain size of $CaCO_3$ on properties. Photographs, tables.

318* The Effect of Toning Agents on the Hiding Power of White Architectural Enamels. W. H. Madson and F. A. Lilley. *Official Digest. Federation of Paint and Varnish Production Clubs*, 1953, no. 345, Oct., pt. 2, p. 1-39.

Reports experimental study of various colored pigments in paint containing TiO_2. Graphs, diagrams.

319 Optical Properties of Paints—The Basic of Instrumental Measurements. D. L. Tilleard and T. R. Bullett. *Oil & Colour Chemists' Association, Journal*, v. 36, Oct. 1953, p. 545-568.

Discusses measurement of gloss, opacity, and colour. Describes method and instruments at present available, principles on which they are based, and their scope and limitations in use. Photographs, tables, diagrams, graphs. 28 ref.

320 How Painting Affects Storage-Tank Losses. W. L. Nelson. *Oil and Gas Journal*, v. 52, Nov. 2, 1953, p. 130.

Discusses effect of color of paint on warming of storage tanks in sunlight. 11 ref.

321* Airless Spray Painting. James A. Bede. *Paint Industry Magazine*, v. 68, Sept. 1953, p. 10-12.

Discusses process employing hydraulic pressure and heat. Photograph, diagram.

322 The Why and Wherefore of Automotive Finishing and Testing. Wardley D. McMaster. *Paint Manufacture*, v. 23, Oct. 1953, p. 325-332.

Discusses general finishing problems and testing procedures involved in developing a finish, protective to metallic elements and pleasing in appearance. Photograph, tables, graphs. 10 ref.

323 Electrostatic Paint Spraying. Richard Tilney. *Paint Manufacture*, v. 23, Oct. 1953, p. 335-336.

Describes development of techniques to atomize the coating material and to deposit it on the workpiece. Photograph, diagram.

324 Practical Applications of Radioisotopes in Protective Coatings. Howard Gottlieb. *Paint, Oil & Chemical Review*, v. 116, Oct. 8, 1953, p. 56-58, 60.

Discusses applications of isotopes in research on plasticizers, cleaning and preparation of surfaces, resin polymerization, and analysis of drying oils. Diagrams, photograph.

325 Observations on the Use of Dimethyl Isophthalate. Frank Oswald. *Paint, Oil & Chemical Review*, v. 116, Oct. 8, 1953, p. 78.

Describes studies on use of alkyds in coatings.

326 Latex Paints. Henry Fleming Payne. *Paints, Oil & Chemical Review*, v. 116, Oct. 22, 1953, p. 14, 16, 18, 20, 22, 42, 44-46, 48-49.

Discusses compositions, properties, problems to be dealt with, and methods of manufacture and film formation. Tables. 36 ref.

327 Recent Developments in Pigment Technology. *Paint and Varnish Production*, v. 43, Oct. 1953, p. 32-52.

Includes papers on "Zinc Pigments", S. Werthan; "Titanium Dioxide Pigments", W. B. Anderson; "White Lead Pigments"; "Carbon Blacks"; "Inorganic Colors", Ralph T. Urich; "Organic Colors", Aaron Permut; "Aluminum Pigments", Alexander F. Knoll; "Extender Pigments", Peyton Wheeler; "Pigments for House Paints", W. G. Vannoy; "Metal Protective Pigments Red Lead", C. J. Vander Valk; "Zinc Chromate", H. A. Wakefield and "Pigments for Industrial Finishes", Stanley S. Morris.

328* What Does Painting Cost? L. G. Jones. *Power Engineering*, v. 57, Oct. 1953, p. 90-93.

Explains how to estimate paint jobs properly and how to be sure of good value. Photographs, tables, graph.

329* Selection of Interior Finish for Home Freezers. O. J. Spawn. *Refrigerating Engineering*, v. 61, Sept. 1953, p. 972-973.

Discusses requirements and gives finishing recommendations. Table, diagram.

330* Defects of Alumina Films, in Relation to the Structure of Aluminum and Its Alloys. (French.) P. Bussy. *Revue de Métallurgie*, v. 50, no. 9, Sept. 1953, p. 629-634.

Reports on electron microscopic studies of thin alumina films obtained by anodic oxidation. Effects of additions and the rate of cooling upon the structure are demonstrated. Micrographs. 11 ref.

331 Driers, Plasticizers, and Chemical Specialties Index. W. M. Lawall. *Scientific Section National Paint, Varnish and Lacquer Association, Inc*, Sept. 1953, supl. 2, cir. 737, 52 p.

Presents characteristics of various emulsifiers, flatting agents, and wetting agents. Tabulated.

332* U. S. Government Paint Specifications. W. M. Lawall. *Scientific Section National Paint, Varnish and Lacquer Association, Inc.*, Sept. 1953, suppl. 14, cir. 751, 225 p.

333 The Uniformity of Galvanized Coatings and the Expected Life of the Galvanized Article. N. B. Rutherford. *Sheet Metal Industries*, v. 30, no. 318, Oct. 1953, p. 891-893.

Withdrawal conditions were much more important than presence or absence of small Al content in producing uniform coatings. A modified practice made possible a reduction in Zn consumption without affecting expected life of galvanized ware. Diagrams, tables. 9 ref.

334 The Strains in Vitreous Enamels Fired on Metals. H. Moore. *Sheet Metal Industries*, v. 30, no. 318, Oct. 1953, p. 909-914.

Discusses effects of differences between expansion coefficients of enamel coating and metal. Tables, diagram.

9. *Coatings*

335 Animal Fats in Hot Dip Tinning. E. G. Fochtman, L. C. Kinney, G. G. Ference, R. W. Riemenschneider, S. G. Morris, and W. C. Ault. *U. S. Dept. of Agriculture, Bureau of Agriculture and Industrial Chemistry, AIC. No.* 354, 1953, 14 p. (S584 Un3agi)

Results show that better grades of greases and tallows with appropriate processing perform as well or better than palm oil. Cost of processing is not prohibitive and price of the finished oil is favorable compared to average prices of palm oil. Tables.

336 Relative Importance of Various Sources of Defect-Producing Hydrogen Introduced into Steel During Application of Vitreous Coatings. Dwight G. Moore, Mary A. Mason, and William N. Harrison. *U. S. National Advisory Committee for Aeronautics, Report* 1120, 1953, 12 p. (TL521 Un3r)

Results show that dissolved water in the frit is the principal source of hydrogen. In normal enameling operations chemically combined water in the clay, milling water, quenching water, and acid pickling are minor sources of H. Tables, graphs, micrographs, diagram.

Books and Miscellaneous Publications

337 Enamel Bibliography and Abstracts. Roger L. Fellows, compiler. 487 p. 1953. American Ceramic Society, Columbus. (Z7914.E5 Am35c)

Presents a compilation of all published material from 1940 to 1949. Includes abstracts on porcelain enameling and references pertaining to refractory coatings for metals.

See also:
41 (pesticidal coatings)
728 (thickness of metal films)
790 (metal films for interferometry)
862 (cast iron for enameling)
940 (Si coating on Ti)

10. CORROSION

338* Behavior of Pure Aluminum and Superpure Aluminum in Boiling Water. (German.) D. Altenpohl. *Aluminium*, v. 29, no. 9, Sept. 1953, p. 361-370.

Presents methods for applying colorless "Bohmit" films which offer corrosion protection against acids. Photographs, graphs, tables. 17 ref.

339* Behavior of Aluminum Towards Food. (German.) Franz Ritter. *Aluminium Ranshofen, Mitteilungen*, 1953, no. 2, July, p. 35-37.

Discusses corrosive effects.

340 Intergranular Corrosion of Ferritic Stainless Steels. R. A. Lula, A. J. Lena, and G. C. Kiefer. *American Society for Metals, Preprint no.* 32, 1953, 27 p. (TS300 Am35t)

Discusses susceptibility to intergranular attack in various acid mixtures when rapidly cooled from temperatures above 1700 F. Tables, graphs, micrographs, photographs. 12 ref.

341 Atmospheric Exposure of Light Metals. L. H. Adam. *American Society for Testing Materials, Preprint no.* 13s, 1953, 24 p. (TA401 Am35p)

Describes tests using 27 Al and 8 Mg alloys. Extensive photographs.

342* Container Materials for Liquid Explosives Produced From Concentrated Nitric Acid. (German.) Hans Hohn and Erich Fitzer. *Berg- und hüttenmännische Monatschefte der montanistischen Hochschule in Leoben*, v. 98, no. 9, Sept. 1953, p. 187-193.

Test data indicate Al is superior to Fe.

343 Test on the Corrosion of Buried Iron and Steel Pipes. J. C. Hudson and G. P. Acock. *British Iron and Steel Research Association, Special Report no.* 45, 1952, p. 1-28; disc., p. 111-153.

Report covers corrosion of cast-iron pipes and tubes, buried in 5 representative soils for 5 years. Bare and coated specimens were tested. Tables.

344 Investigations on Underground Corrosion. K. R. Butlin, W. H. J. Vernon, and L. C. Whiskin. *British Iron and Steel Research Association, Special Report no.* 45, 1952, p. 29-38; disc., p. 111-153.

Part I includes fundamental studies on sulphate-reducing bacteria and their effect on iron. Part II describes experiments on the protection of ferrous pipes. Photograph, table. 8 ref.

345 Corrosion of Buried Copper and Ferrous Strip in Natural and Salted Soils. *British Iron and Steel Research Association, Special Report no.* 45, 1952. p. 39-45; disc., p. 111-153.

Describes investigation to determine relative corrodibility in different soils. Effect of salt treatment is discussed. Table, graphs. 2 ref.

346 Tests on the Corrosion of Buried Aluminium, Copper, and Lead. P. T. Gilbert and F. C. Porter. *British Iron and Steel Association, Special Report no.* 45, 1952, p. 55-74; disc., p. 111-153.

Tubes of commercial-purity Al, phosphorus-deoxidized arsenical Cu, and Pb were buried. Soils used were salt marsh, London clay, moist neutral clay, Keuper Marl, and cinders. Results of examination after burial for 5 years are given. Tables. 5 ref.

347 Cathodic Protection. K. A. Spencer. *British Iron and Steel Research Association, Special Report no.* 45, 1952, p. 75-94; disc., p. 111-153.

Briefly discusses principal causes of corrosion of buried steel structures and theory of protection by cathodic methods. Graphs, diagrams, table. 9 ref.

348 Cathodic Protection of Buried Metal Structures. R. de Brouwer. *British Iron and Steel Research Association, Special Report no.* 45, 1952, p. 95-110; disc., p. 111-153.

Describes cathodic protection by polarized and forced drainage processes. Diagrams, graphs.

349 Corrosion Control of Steel Equipment. T. R. B. Watson. *Canadian Chemical Processing*, v. 37, Sept. 1953, p. 46, 48, 50, 52, 54.

Describes causes of corrosion and discusses control by means of cathodic protection.

350 Worthite. W. E. Pratt. *Chemical Engineering*, v. 60, Nov. 1953, p. 264, 266, 268, 270, 272, 274, 276, 278.

Discusses resistance of high Cr alloy to a number of corrosives, mechanical properties, and applications in chemical industry.

351 Corrosion. A Field for Action. W. H. J. Vernon. *Chemistry & Industry*, 1953, no. 38, Sept. 19, p. 982-987.

An historical review. Diagram, graph. 6 ref.

352 Note on the Anomalous Behaviour of Ammonium Chloride Particles on the Corrosion of Steel in Humid Atmospheres. B. Sanyal and R. St. J. Preston. *Chemistry & Industry*, 1953, no. 38, Sept. 19, p. 995-997.

Corrosion rate was found to decrease with increased humidity. Photographs, tables. 6 ref.

353 Resistance of Aluminum Alloys to Weathering. C. J. Walton, D. O. Sprowls, and J. A. Nock, Jr. *Corrosion*, v. 9, Oct. 1953, p. 345-358.

Gives results of extensive testing over a period of 20 years and actual use over 52 years. Photographs, tables, graphs. 11 ref.

354* Some Marine Aspects of Cathodic Protection. K. N. Barnard. *Engineering Journal*, v. 36, Sept. 1953, p. 1131-1132, 1138.

355 Corrosion in Closed Circulating Water Systems. Sidney Sussman and James B. Fullman. *Heating and Ventilating*, v. 50, Oct. 1953, p. 77-82.

Discusses effect of temperature, O_2, chemicals, leakage, and design on corrosion. Graphs, diagrams, photograph.

356 Corrosion. Mars. G. Fontana. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 95A-97A.

Describes electrolytic etching of cast and wrought stainless

steels in oxalic acid (15 min.) as a screening procedure for the 240 hr. nitric acid test. Photographs, micrographs.

357* Corrosion and Silting in Water Meters. P. Scanes. *Instrument Engineer*, v. 1, Oct. 1953, p. 69-71.

Discusses meter design, effects of different waters, materials of manufacture, and interference from foreign matter. Photographs, diagrams.

358 Corrosion of Aluminium Alloys in Supply Waters. F. C. Porter and S. E. Hadden. *Journal of Applied Chemistry*, v. 3, Sept. 1953, p. 385-409.

Describes severe pitting of Al and its alloys caused by action of stagnant or slow moving water. Tables, photographs, graphs. 8 ref.

359* Practical Considerations of Titanium. (French.) *Métallurgie et la construction méchanique*, v. 85, no. 8, Aug. 1953, p. 615-617.

Discusses corrosive action of salt water. Describes difficulties of obtaining pure Ti. Presents mechanical properties of sheet and bar Ti and Ti alloys. Table, graph.

360 Systematic Approach to Corrosion Mitigation. Marshall E. Parker. *Oil and Gas Journal*, v. 52, Nov. 2, 1953, p. 116-118.

Discusses corrosion of buried pipelines and prevention by cathodic protection.

361* Cathodic Protection of Under River Pipe Lines. C. C. Lloyd and John R. Whitney. *Pipe Line News*, v. 25, Oct. 1953, p. 46-51.

Describes details of design including discussion of anodes and wiring. Table, diagrams, graphs.

362* Recirculating-Water Systems Need Expert Treatment Supervision. Sheppard T. Powell. *Power*, v. 97, Sept. 1953, p. 86-89, 200, 202, 204.

Discusses coatings, inhibitors, and performance factors. Graphs, diagrams, photographs.

363* Experiences on Corrosion and Corrosion Protection on Iron and Steel. (German.) (Review of Literature of 1950 and 1951). Heinrich Klas and Walter Hogartz. *Stahl und Eisen*, v. 73, no. 20. Sept. 24, 1953, p. 1302-1308.

Discusses metallic and nonmetallic protective coatings. 134 ref.

364 430 Stainless is Hardy Civilian. A. H. Thomas. *Steel*, v. 133, Sept. 28, 1953, p. 88-89.

Describes outdoor corrosion research. Photographs.

365* Uneven Corrosion in Alkaline Pulping Digesters. Francis W. Flynn, Frederick H. Richter, and Frederick B. Snyder. *Tappi*, v. 36, Oct. 1953, p. 433-444.

Describes major cause and possible cures. Diagrams, graphs, photographs.

366 Corrosion and Deposits in Regenerative Air Preheaters. J. F. Barkley, Hilmer Karlsson, A. A. Berk, C. F. Stark, and L. R. Burdick. *U. S. Bureau of Mines, Report of Investigations* 4996, Aug. 1953, 23 p. (TN21 Un3r)

Field tests were made under regular operating conditions of an air preheater serving as underfeed, stoker-fired, water-tube boiler. Plant equipment is described. Pertinent plant operating data over testing period is tabulated.

367* Increasing Corrosion-Fatigue Strength of Steel by Internal Stress. (German.) Hans Bühler. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 27, Sept. 21, 1953, p. 945.

Discusses above. 5 ref.

368* Corrosive Effects of Varying Concentrations of Nitric and Sulfuric Acids on Welds of Aluminum and Aluminum Alloys. (German.) Waldemar Bleicher and Albrecht Müller-Busse. *Werkstoffe und Korrosion*, v. 4, nos. 8-9, Aug.-Sept. 1953, p. 273-280.

Concentrations of either acid acted rapidly on the welds. Graphs, micrographs, photographs. 5 ref.

369* Corrosive Action of Highly Concentrated Nitric Acid on Iron. (German.) Erich Fitzer, Hans Hohn, and Johann Sekal. *Werkstoffe und Korrosion*, v. 4, nos. 8-9, Aug.-Sept. 1953, p. 290-298.

Influence of test conditions, pre-test treatment, and composition on intergranular attack is described. Photographs, graphs, tables. 10 ref.

370* Corrosive Behavior of Iron-Containing 90/10 Copper-Nickel Alloys. (German.) Karla Krafack and Erich Franke. *Werkstoffe und Korrosion*, v. 4, nos. 8-9, Aug.-Sept. 1953, p. 310-315.

Studies behavior in sea water under various test conditions. Graphs, tables.

371* Aluminum Bronze Alloy Used in Large Cast Water Wheels to Resist Pitting by Cavitation. *Western Metals*, v. 11, Oct. 1953, p. 76-77.

Reports tensile strength; corrosion fatigue strength; hardness; yield point; cold working qualities; and grain size, shape and structure affect ability of a metal to withstand pitting. Describes field tests with aluminum bronze alloy. Photographs.

372* Vulnerability of Drill Pipe to Corrosion Fatigue. Stanley C. Moore and A. P. Farr. *World Oil*, v. 137, Oct. 1953, p. 200, 202, 204, 206, 208.

Discusses corrosion problems in drilling oil wells in the Permian Basin. Graph, photographs. 8 ref.

See also:
280 (corrosion protection of Al)
306 (corrosion protection of steel)
804 (corrosion of Ta and Zr)
979 (corrosion properties of Al alloys)

11. ELECTRICAL ENGINEERING

373 *American Power Conference, Proceedings*, (Annual Volume), v. 15, 1953. 659 p. Illinois Inst. of Technology, Chicago.

Discusses problems of interest to those in the power industry, with emphasis on the broad over-all aspects rather than technical details.

374* The Exact Value of the Capacitance of Straight-Line-Capacity Condensers. (German.) W. von Guttenberg. *Annalen der Physik*, v. 12, nos. 7-8, 1953, p. 321-339.

Permits more accurate measurements and computations. Diagrams, graphs, table. 19 ref.

375* Power Equalizer System for Aircraft Alternators. John A. Granath and Albert K. Hawkes. *Applications and Industry*, 1953, no. 8, p. 209-214; disc., p. 214-217.

Shows how to obtain analytical expressions for voltage and frequency in 400 cycle, a.c. aricraft electric system where real and reactive load division are accomplished by equalizer systems. Diagrams, graph. 3 ref.

376* Controlling D-C Arcs. R. L. Hurtle. *Applications and Industry*, 1953, no. 8, p. 225-230; disc., 230.

Presents a method which emphasizes eliminating retrogressive motion of arc. Photographs. 2 ref.

377* Design of Transformers for Resistance Welding Machines. D. L. Knight. *Applications and Industry*, 1953, no. 8, p. 238-243.

Discusses bases of transformer ratings, construction, impedance, efficiency, excitation and core loss; types of secondaries; and insulating materials. Diagrams, graphs, photographs. 4 ref.

378* Electrolytic Condensers. A. Güntherschulze. *Archiv für technisches Messen*, 1953, no. 210, July, p. 165-168.

Discusses oxide-layer, polarization, special-purpose Ta condensers, technical production processes, properties, and measuring methods. Diagram. 9 ref.

379* Change of Electrical Resistance of Thin Platinum Deposits Under Action of Continuous High Voltage. (French.) Marc Erny. *Comptes rendus*, v. 237, no. 5, Aug. 3, 1953, p. 387-389.

Discusses resistance of castings, deposited by thermal evaporation, under potentials of 300-500 V. Graphs.

11. *Electrical Engineering*

380 Electrets. G. G. Wiseman and E. G. Linden. *Electrical Engineering*, v. 72, Oct. 1953, p. 869-872.

Discusses materials, measurements, theories concerning formation, and practical applications. Tables, diagrams. 18 ref.

381 Sliding Contacts. A Review of the Literature. Frank Spayth and Stanton East. *Electrical Engineering*, v. 72, Oct. 1953, p. 912-917.

Reviews subject emphasizing generated noise and contact wear, configuration, resistance, force, and surfaces. Diagrams, tables. 43 ref.

382 Field Testing 400-Kv Circuit Breakers. Gunnar Jancke and Uno Sandström. *Electrical Engineering*, v. 72, Nov. 1953, p. 1015-1020.

Describes work with 3 types of 40-kv. breakers in 5 different situations on a Swedish transmission system. Photographs, graphs, table.

383 Applying Electrical Controls to Dual-Function Hydraulic Circuits. R. S. Conabee. *Electrical Manufacturing*, v. 52, Sept. 1953, p. 108-111, 380, 382.

Describes plastic molding press and applications. Diagrams, photograph.

384* Small Hydro Sites Can Be Developed Economically. H. H. Gnuse, Jr. *Electrical World*, v. 140, Sept. 7, 1953, p. 80-82.

Describes advances in design of dams, electrical controls, and appurtenances to develop the sites. Table, photographs.

385* Organizing a Voltage Change Over. A. R. Perdue. *Electrical World*, v. 140, Sept. 7, 1953, p. 83-85.

Describes procedure for conversion to higher distribution voltages. Diagrams, photographs.

386* Capacitor Frontiers Still Expanding. V. A. Hydbeck and P. E. Hendrickson. *Electrical World*, v. 140, Sept. 7, 1953, p. 86-89.

Discusses factors contributing to expansion and advantages of capacitors. Graphs.

387* Rotating Regulators Improve Light-Load Stability. I. Analysis of Problem; Regulator Requirements. L. F. Lischer and R. B. Gear. *Electric Light and Power*, v. 31, Oct. 1953, p. 106-111.

Discusses addition of rotating-amplifier-type regulators to large generating units as an aid in stability at light loads. Graphs, diagram, table, photographs. (To be continued.)

388* 12-Kv Distribution is Economical and Workable at Dayton. R. B. Killen. *Electric Light and Power*, v. 31, Oct. 1953, p. 135-139.

Describes distribution feeders at the Dayton Power and Light company. Table, photographs. 3 ref.

389 The Design of Electromagnets. I. L. R. Blake. *Electronic Engineering*, v. 25, Sept. 1953, p. 380-385.

Presents data on fringing curves, curves to assist in permeance estimates, magnetization curves of d.c. magnet materials, and heat dissipation curves. Diagrams, table, graph.

390 Movable-Anode Tube Gages Surface Roughness. Joseph B. Bidwell. *Electronics*, v. 26, Nov. 1953, p. 181-183.

Describes unit adaptable to wide range of surfaces. High electrical output of tube reduces complexity of amplifying and indicating circuits. Diagrams, graphs, photographs.

391* Thermal and Dynamic Strength of High Voltage. Current Transformers with Aluminum Windings. (Hungarian.) Béla Török and Tibor Csizy. *Elektrotechnika*, v. 46, no. 4, Aug. 1953, p. 117-125.

Compares Cu and Al wound transformers.

392* Automatic Static Voltage Regulator for Generators. (Hungarian.) László Forgaras and Gyorgy Révesz. *Elektrotechnika*, v. 46, no. 5, May 1953, p. 131-141.

Discusses working principles. Describes characteristics of generators influencing regulation. Diagrams, graphs. 5 ref.

393* Constants of Synchronous Motors at Sudden Change in Working Conditions. (Hungarian.) Frigyes Csaki. *Electrotechnika*, v. 46, no. 7, July, 1953, p. 194-198.

Discusses effects of transient and subtransient reactances. Diagrams. 3 ref.

394* Silicone Insulating Materials in the Design of Transformers. (German.) Gerhard Ehlers. *Elektrotchnische Zeitschrift*, v. 74, no. 19, Oct. 1, 1953, p. 553-558.

Discusses properties and uses of silicone lacquers and silicone rubber as insulating materials. Emphasizes effect of aging and temperature on physical and electrical properties. Tables, graphs. 11 ref.

395* Measuring the Properties of Electrical Connectors. (German.) Martin Gerlach. *Elektrotechnische Zeitschrift*, v. 74, no. 20, Oct. 11, 1953, p. 582-586.

Describes experiments comparing various types of clamps for conductivity and strength. Standardization of tests was proposed. Diagrams.

396 Power for Tomorrow. *General Electric Review*, v. 56, Sept. 1953, p. 8, 10-14.

Discusses growth of electric power industry and forecasts further increases. Graphs, photographs.

397 How the Autronic-Eye Automatic Headlamp Control Was Designed to Meet Driver Requirements. George W. Onksen. *General Motors Engineering Journal*, v. 1, Sept.-Oct. 1953, p. 20-25.

Gives design and performance characteristics. Diagrams, graphs. 4 ref.

398 Electrical Decomposition of Sulfur Hexafluoride. David Edelson, C. A. Bieling, and G. T. Kohman. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 2094-2096.

This study was to evaluate SF_6 as an insulation medium to determine the hazards from breakdown. Safety measures and proper procedures are given. Photograph, diagram, table, graph. 9 ref.

399 Feedback Theory. Some Properties of Signal Flow Graphs. Samuel J. Mason. *I.R.E., Proceedings*, v. 41, Sept. 1953, p. 1144-1156.

Equations characterizing a systems problem may be expressed as a network of directed branches.

400 Abnormal Oscillations in Electric Circuits Containing Capacitance. Niels H. Knudsen. *Kungl. Tekniska Högskolans Handlingar* (Transactions of the Royal Institute of Technology, Stockholm, Sweden), no. 69, 1953, 133 p. (T4 K96t)

Presents detailed accounts of unwanted oscillations occuring in electric circuits containing capacitance in combination with transformers or a.c. machines. Discusses treatment which may prove to be a step in the direction of solving the problems of ferro-resonance.

401* Correction of Power Factor With Static Capacitors. George C. Barnes. *Mechanization*, v. 17, Aug. 1953, p. 111-115.

Discusses basis for power factor clauses, correction, capacitor application based on power tariff, and capacitor as an investment. Tables, photographs, graphs.

402* Today's Electrical Practice. James J. O'Connor. *Power*, v. 97, Oct. 1953, p. 73-124.

Reports on early planning as a key to a modern system, setting up plant's power supply, carrying electricity to the job, and putting electricity to work. Graphs, tables, diagrams.

403* Modern Drives and Controls in Heavy, Reversing Mill Trains and Cold-Rolling Mills. (German.) Horst Nüsslin. *Stahl und Eisen*, v. 73, no. 18, Aug. 27, 1953, p. 1148-1155.

Surveys the improvements effected in rolling mills in recent years including motors used, twin drives, ground connection controls, and centrifugal couplings. Photographs, graphs, diagrams. 4 ref.

404 Multiple Contact Resistance. William B. Kouwenhoven and Donald R. Hagner. *Welding Journal*, v. 32, Sept. 1953, p. 432s-440s.

Analyzes resistance in high-current low-impedance applications. Diagrams, photographs, graphs. 9 ref.

405 Synchrotic Systems. S. J. Campbell. *Westinghouse Engineer*, v. 13, Nov. 1953, p. 178-183.

Reviews principles of the above. Photograph, diagrams, graphs.

406* Electrical Resistance Measurements of Powders. (German.) Hans V. Wartenberg. *Zeitschrift für angewandte Physik*, v. 5, no. 8, Aug. 1953, p. 291-292.

Discusses measuring of specific resistance by adding to an electrolyte solution. 5 ref.

12. ELECTROCHEMISTRY AND ELECTROPROCESSES

407* Electrolytic Polishing of Special Steel and Alloys. (English.) *Aciers Fins & Speciaux Francais*, 1953, no. 14, July p. 32-37.

Discusses the above, its potentialities for industrial use, and properties of finished surfaces. Photographs.

408* On the Mechanism of Electrolytic Polishing. (French.) Eugéne Darmois and Israël Epelboin. *Comptes rendus*, v. 237, no. 10, Sept. 7, 1953, p. 503-504.

Process is explained by the passage of ClO_4 ions by adsorption to the surface to be polished. The layer thus formed contains a sufficiently intensive electric field to cause the metal ions to pass directly into the solution. 6 ref.

409* Theory and Practice of Chemical Polishing. I. Chemical Processes for Copper-Base Alloys. R. Palmer. *Electroplating and Metal Finishing*, v. 6, Oct. 1953, p. 360-367.

Chemical polishing is compared to and contrasted with electropolishing and mechanical polishing. Refers to an unpublished method for Cu-based alloys and Ni with certain advantages over the Battelle process. Other new work is reported. Table, graph.

410 Roughness in Bright Nickel Electrodeposits. C. J. Swanson. *Institute of Metal Finishing, Bulletin*, v. 3, Summer 1953, p. 91-112.

Discusses causes of various types of surface defects. Photographs, tables. 6 ref.

411* Tin-Nickel Alloy Coatings—Estimation of Thickness and Porosity. S. C. Britton and D. G. Michael. *Institute of Metal Finishing, Bulletin*, v. 3, Autumn, p. 143-162.

Describes electrolytic dissolution of Sn-Ni alloy in phosphoric acid solution at 180 C. Porosity was best determined by ferricyanide method. Photographs, graphs, tables. 7 ref.

412* Rhodium Plating and Its Modern Applications. E. H. Laister and R. R. Benham. *Institute of Metal Finishing, Bulletin*, v. 3, Autumn, p. 181-203.

Discusses plating with Rh (sulfate process), and its advantages relative to resistance to heat and corrosion. Photograph, tables.

413 A Laboratory Study of a Commercial Method of Electroplating Aluminium. J. Edwards and C. J. Swanson. *Institute of Metal Finishing, Transactions, Advance Copy no.* 5, v. 29, 1953, 11 p. (TS670 E25j)

Describes laboratory-scale investigation of mechanism of electrolytic process for improvement and simplification. Tables.

414 Complex Fluorides for the Deposition of Tin and Tin Alloys. A. E. Davies, R. M. Angles, and J. W. Cuthbertson. *Institute of Metal Finishin, Tranactions, Advance Copy no.* 7, v. 29, 1953, 14 p. (TS670 E25j)

Discusses effects of addition agents, anode sludging, and electrode efficiencies. Tables, graphs, micrograph. 11 ref.

415 Structural and Kinetic Phenomena Observed During the Anodic Polarization of Metals. H. R. Thirsk and W. F. K. Wynne-Jones. *Institute of Metal Finishing, Transactions, Advance Copy no.* 9, v. 29, 1953, 14 p. (TS670 E25j)

Describes variety of methods useful in studying reactions at electrodes. Diagrams, micrographs, graphs. 19 ref.

416 The Rate-Determining Stage in the Anodic Dissolution of Metals. A. Hickling, and J. K. Higgins. *Institute of Metal Finishing, Transactions, Advance Copy no.* 10, v. 29, 1953, 18 p. (TS670 E25j)

Presents an experimental study using potentiostat technique of the limiting current densities of metal dissolution in electrolytic polishing solutions. Graphs, tables, diagram. 9 ref.

417 Bright Metal Surface and a Theory of Bright Plating. T. P. Hoar. *Institute of Metal Finishing, Transactions, Advance Copy no.* 11, v. 29, 1953, 8 p. (TS670 E25j)

Reviews several methods by which bright metal surfaces may be produced. Compares fundamental mechanisms of methods and shows how bright plating may be included in general plan.

418 Fluoride v. Sulphate Hard Chrome Solutions. Which Offers Better Plating Properties? R. A. Balbierz and H. D. Burgess. *Iron Age*, v. 172, Oct. 22, 1953, p. 126-130.

Discusses advantages of fluoride-catalyzed chrome plating solutions over standard sulfate baths. Graphs, tables. 7 ref.

419 Effect of Chloride on the Deposition of Copper, in the Presence of Arsenic, Antimony, and Bismuth. V. Hospadaruk and C. A. Winkler. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1375-1377.

Includes graphs, table. 6 ref.

420 Recent Developments in the Plating of Aluminium. *Light Metals*, v. 16, Oct. 1953, p. 344-346.

Discusses electrolytic zincate dip pretreatment and Cu flash process prior to subsequent plating with Ni or Cr. Describes direct plating techniques, and corrosion resistance of finishes. Tables. 29 ref.

421 Plating Gun Bores Gives Greater Accuracy and Longer Life. C. E. McDowell. *Machinery*, v. 60, Oct. 1953, p. 158-163.

Describes technique for hard chromium-plating of tube bores for 90-mm. tank guns. Photographs.

422 Black Chromium-Base Electroplating. M. F. Quaely. *Metal Industry*, v. 83, Oct. 9, 1953, p. 299-300.

Outlines some methods tried before a satisfactory solution was obtained. Indicates three methods by which an adherent black coating can be obtained. 6 ref.

423* Special Chromium Plating Equipment. (German.) *Metalloberfläche*, Ausgabe A, v. 7, no. 10, Oct. 1953, p. 152-157.

Describes equipment for plating large quantities of small and special parts. Photographs.

424* Removing Chromium, Especially Hard Chromium. (German.) A. Pollock. *Metalloberfläche*, Ausgabe A, v. 7, no. 10, Oct. 1953, p. 157-158.

Describes electrolytic removal of Cr with and without Ni base. 5 ref.

425* Stripping Electroplated Coatings by Chemical Processes. (German.) Richard Erdmann. *Metalloberfläche*, Ausgabe B, v. 5, no. 9, Sept. 1953, p. 141-142.

Describes processes for removing coats of Ni, Ag, Au, Cu, Zn, Cd, Cr, Sn, and brass.

426* Recent Developments in Chromium Deposition. (German.) Heinz W. Dettner. *Metalloberfläche*, Ausgabe B, v. 5, no. 10, Oct. 1953, p. 149-151.

Reviews recent literature on improved methods. Graphs. 23 ref.

427* D-Chromium Plating. (German.) Artur Kutzelnigg. *Metalloberfläche*, Ausgabe B, v. 5, no. 10, Oct. 1953, p. 156-160.

Describes special uses on different metals. Photographs, micrographs. 6 ref.

428* Practical and Comparative Study of Some Processes for the Preparation of Cast Metal before Electrolytic Coating, or Coating by Immersion in Molten Metals. (French.)

12. *Electrochemistry and Electroprocesses*

G. Lerouge. *Metaux, Corrosion-Industries*, v. 28, no. 337, Sept. 1953, p. 348-369.

Reports results of tests with Ni, Cr, and Sn coatings on various types of castings. Micrographs, tables, diagrams. 12 ref.

429* Spotlighting Finishing Progress. Sulfamate Nickel Plating. Sulfide-Cyanide Copper-Stripping. C. Fred Gurnham. *Products Finishing*, v. 18, Oct. 1953, p. 54, 56, 58, 62, 64, 66, 68, 70, 74, 76, 78, 80, 82, 84.

Discusses processes and their advantages over older methods. Photographs, graph.

430 Aluminum Electrodeposits Made Adherent. W. C. Schickner. *Steel*, v. 133, Nov. 2, 1953, p. 125.

Describes method of dipping metal to be plated in fatty acid solution to give strong bond with base. Photographs. 2 ref.

431* Behavior of Anodes in Cyanide Baths. (German.) W. Machn and A. M. Azzam. *Werkstoffe und Korrosion*, v. 4, nos. 8-9, Aug.-Sept. 1953, p. 298-307.

Describes mechanism of passivation of Cu in solutions of NaCN and $NaCu(CN)_2$ by anodic treatment. Increased concentration of the solutions retard passivation. Graphs, tables. 15 ref.

See also:
657 (electroplating in lithography)
1147 (electrolytic Cr deposits)

13. ELECTRONICS

432 Barium Titanate Admittance-Temperature Characteristics. A. L. Lane. *Acoustical Society of America, Journal*, v. 25, Sept. 1953, p. 873-878.

Describes temperature effects on admittance of barium titanate transducers operating near resonance. Tables, graphs, diagrams.

433* Electronic Conductivity in Colored Alkali-Halide Crystals. (German.) J. Boros and Z. Sibalszky. *Acta Physica Academiae Scientiarum Hungaricae*, v. 2, no. 4, 1953, p. 277-288.

Conductivity of colored NaCl, KBr, and KCl crystals was measured at various temperatures. Tables, graphs. 12 ref.

434* The Coupling of Mechanical and Acoustical Systems in Vibration. (German.) Werner Güttner. *Acustica*, v. 3, no. 4, 1953, p. 201-206.

It was possible under certain conditions of coupling, tuning, and damping to attain a transduction coefficient relatively free from resonance for application to telephones and microphones. Diagrams, tables, graphs. 7 ref.

435 Electronic Brain Reports for Work. *American Gas Association Monthly*, v. 35, Sept. 1953, p. 19, 52.

Describes electronic device which indicates pipe sizes necessary to maintain proper gas pressures for customers. Photographs.

436* Boundary Conditions and Transit-Time Effects in Noise Processes. (German.) R. Wiesner. *Annalen der Physik*, v. 12, nos. 7-8, 1953, p. 361-378.

Reviews literature. Describes investigation of noise in electron tubes. Graphs. 22 ref.

437* Open-Loop Frequency Response Method for Nonlinear Servomechanisms. R. L. Cosgriff. *Applications and Industry*, 1953, no. 8, p. 222-225.

Discusses a graphical representation similar to the common Nyquist diagrams. Table, diagrams. 8 ref.

438* Aircraft Protection From Thunderstorm Discharges to Antennas. J. M. Bryant, M. M. Newman, and J. D. Robb. *Applications and Industry*, 1953, no. 8, p. 248-252; disc., p. 253-254.

Discusses development of unit which protects radio equipment and also records by-passed current and charge magnitudes. Photographs, diagrams.

439* Measuring the Wave Mode of the Electron Ray of a Traveling Field Filament Tube. (German.) Herbert Schnitger. *Archiv der elektrischen Übertragung*, v. 7, no. 9, Sept. 1953, p. 415-420.

Describes action of traveling wave tubes. Diagrams, graphs. 5 ref.

440* Measurement Apparatus and Procedure of Work in Static Tests. I. Survey. (German.) H. Israel. *Archiv für technisches Messen*, 1953, no. 211, Aug., p. 171-174.

Presents objectives and principles of measurement of radio static. Diagrams, graphs.

441 The Basic Design of Constant Resistance Crossovers. N. H. Crowhurst. *Audio Engineering*, v. 37, Oct. 1953, p. 21-22, 108-110.

Discusses an analysis of response and phase characteristics of constant-resistance crossover networks worked out for filters employing from one to four elements. Diagrams.

442 Handbook of Sound Reproduction. Edgar M. Villchur. *Audio Engineering*, v. 37, Oct. 1953, p. 42-48.

Discusses tube and circuit characteristics and their effect on frequency response and distortion in low-level stages of audio amplifiers. Diagrams, graph. 4 ref.

443 The Amplifier and Its Place in the High-Fidelity System. H. H. Scott. *Audio Engineering Society, Journal*, v. 1, July 1953, p. 246-254.

Discusses characteristics of amplifiers for use in phonographs and recording equipment. Graphs, photographs.

444 The Diffraction of Electro-Magnetic Waves by a Semi-Infinite Circular Wave Guide. J. D. Pearson. *Cambridge Philosophical Society, Proceedings*, v. 49, Oct. 1953, p. 659-667.

An exact solution is obtained for the diffraction of a plain harmonic electro-magnetic wave. 6 ref.

445 Improved Frequency Stability of Oscillators With Dual Crystals. Douglas A. Venn and George W. Arnold. *Communication Engineering*, v. 13, Sept.-Oct. 1953, p. 30-33, 38, 39, 41.

Reports that stability is improved by employing two crystals with opposite temperature coefficients. Diagrams, graphs.

446* Getting Started on Single Sideband. VI. J. N. Brown. *CQ Radio Amateurs' Journal*, v. 8, Sept. 1953, p. 19-22, 54, 56-60.

Describes 1-kw linear amplifier. Diagrams, tables.

447* The Terrible T and Gamma, Too! William I. Orr. *CQ Radio Amateur's Journal*, v. 8, Oct. 1953, p. 15-20.

Describes development and use of the *T* and *Gamma* matching networks. Diagrams.

448* Modern Coaxial-Cable Technique in Great Britain. Eric Baguley. *Electrical Communication*, v. 30, Sept. 1953, p. 186-216.

Gives brief historical survey. Discusses merits of various designs of coaxical pairs and methods for quantatively assessing attenuation performance and impedance uniformity. Graphs, diagrams, tables, photographs. 23 ref.

449 Communications Synchronizing Systems. F. T. Turner. *Electrical Engineering*, v. 72, Oct. 1953, p. 874-876.

Reviews conventional systems in light of F.M. theory and shows how properly designed system can maintain highly accurate synchronism even in presence of what appear to be high noise levels. 3 ref.

450 D-C Amplifier Employing Junction-Type Transistors. Edward Keonjian. *Electrical Engineering*, v. 72, Nov. 1953, p. 961-964.

Describes direct-coupled amplifier circuits, methods for solution of the drift problem, and operation of a 2-stage amplifier. Diagrams, graphs.

451 Mass Spectrometer for Automatic Process Control. James R. Bradburn. *Electrical Manufacturing*, v. 52, Sept. 1953, p. 112-115.

Describes operation of spectrometer. Diagram, photographs.

452 Solderless Electronic Assembly With Cellular Units. P. J. Selgin. *Electrical Manufacturing*, v. 52, Sept. 1953, p. 139-142.

Describes technique based on small, triple-contact molded cells pressed against a printed-circuit base. Diagrams, photographs.

453 Aging Circuits for Electronic Tubes. George A. Holt. *Electrical Manufacturing*, v. 52, Sept. 1953, p. 159, 372, 374.

Extended abstract from AIEE conference paper presented at Southern District Meeting, Louisville, Ky., April 1953. Gives techniques for testing and aging. Diagrams.

454* Thyratron Tube Locator Spots Overhead Grounds. Frank M. Hartz. *Electrical World*, v. 140, Sept. 7, 1953, p. 92-93.

Describes operation of locator. Diagrams, photographs.

455 Transistor Circuits and Applications. G. C. Sziklai. *Electronic Engineering*, v. 25, Sept. 1953, p. 358-364.

Describes simplified circuits. Diagrams, graphs, photographs. 6 ref.

456 A Band Pass Filter for Low Frequencies. G. W. Morris and P. G. M. Dawe. *Electronic Engineering*, v. 25, Sept. 1953, p. 365-369.

Describes 2 alternative types of circuits and compares their stability. Graphs, photograph, diagrams. 12 ref.

457 The Electrical Synthesis of Musical Tones. III. Alan Douglas. *Electronic Engineering*, v. 25, Sept. 1953, p. 370, 372-373.

Discusses intermodulation, loudspeakers, volume level, and aesthetic and commercial considerations. Photograph.

458 The Vapotron. G. Ashdown. *Electronic Engineering*, v. 25, Sept. 1953, p. 378-379.

Describes advantages of cooling of high-power tubes by vaporization. Diagram, photographs, graph, table.

459 A Wide-Range Oscillator for Use With the Mass-Spectrometer Probe. R. L. F. Boyd and D. Morris. *Electronic Engineering*, v. 25, Sept. 1953, p. 389-390.

Gives design and performance. Diagram, photograph.

460 A Simple Decimal Counter Using Binary Units. W. C. G. Slatter. *Electronic Engineering*, v. 25, Sept. 1953, p. 391-392.

Describes code for expressing the integers 0-9 in four binary digits. Tables.

461 A Method of Inserting Blanking Into a Television Video Waveform. J. E. Attew. *Electronic Engineering*, v. 25, Sept. 1953, p. 392-393.

Gives circuit diagrams.

462 Computing Machines. R. Bird. *Electronic Engineering*, v. 25, Oct. 1953, p. 407-410.

Outlines method of conversion of numbers from any scale of constant or variable radix to and from binary notation. Diagrams. 3 ref.

463 V.H.F. Aerial Radiation Pattern Measurements. E. G. Hamer. *Electronic Engineering*, v. 25, Oct. 1953, p. 427-431.

Discusses precautions to be taken when measuring polar diagram of V.H.F. aerials, actual techniques of measurement, method of presentation, and analysis of results obtained.

464 Computer Simulates Moving Radar Targets. W. B. Birtley. *Electronics*, v. 26, Sept. 1953, p. 137-139.

Describes use of dual analog computers for training radar men. Diagrams.

465 Line Selector Checks Television Waveforms. Edward M. Buyer. *Electronics*, v. 26, Sept. 1953, p. 153-155.

Describes design, circuit details, operation, and applications. Diagrams, photographs.

466 Three-Tone Oscillator Broadcasts Time Signal. Sidney Feldman. *Electronics*, v. 26, Sept. 1953, p. 162-163.

Shows how separate Wien-bridge oscillators supply 3 components of A-minor chord used for hourly time signal. Frequency combination proves to be more pleasing and harmonious than single-frequency beep. Diagrams.

467 Vibrating-Wire High-Q Resonator. Arthur W. Dickson and William P. Murden. *Electronics*, v. 26, Sept. 1953, p. 164-167.

Shows how electrically driven vibrating wire fills gap between 5 and 50 kc. Describes high-selectivity filtering or control of oscillator frequency. Diagrams, photographs.

468 Wide-Band Data Transmitter. D. J. Gray, V. P. Gurske, and W. E. Morrow. *Electronics*, v. 26, Sept. 1953, p. 168-170.

Describes a frequency-modulated oscillator which uses double phantastron circuit for linear data-recording system. Diagrams.

469 Low-Distortion Transistor Audio Oscillator. Peter G. Sulzer. *Electronics*, v. 26, Sept. 1953, p. 171-173.

Spot frequencies through audio range are provided by a self-powered instrument using 3 *pnp* junction transistors. Total r.m.s. distortion and noise at center frequencies is less than 0.03%. Diagrams, photographs.

470 Sound-Reinforcing System for Theater-Type Studio. L. J. Kleinklaus. *Electronics*, v. 26, Sept. 1953, p. 174-175.

Describes circuits and arrangement of loudspeakers. Photographs, diagrams.

471 Simplified Vectorscope Measures Phase. William L. Firestone and Roy A. Richardson. *Electronics*, v. 26, Sept. 1953, p. 180-182.

Describes apparatus useful in design of phase shift filters, delay lines, phase-modulation systems, and high-speed radio direction finders. Diagrams.

472 Wide-Range Calibrator for Vibration Pickups. Wilfred A. Yates and Martin Davidson. *Electronics*, v. 26, Sept. 1953, p. 183-185.

Describes non-loading displacement transducer which when used with vibration generator calibrates vibration pickups from 0.01 in. to 10 μin. Extension of design can be used as controller in vibration generator servo-loop system. Diagrams, graphs.

473 Balance Measurements on Balun Transformers. O. M. Woodward, Jr. *Electronics*, v. 26, Sept. 1953, p. 188-191.

Comparator for measuring balance efficiency is described. Results of tests on typical U.H.F. and V.H.F. balance-to-unbalance transformers are reported. Diagrams. 2 ref.

474 Cathode-Follower Design Charts. N. O. Sokal. *Electronics*, v. 26, Sept. 1953, p. 192-194, 196.

Presents precedure which simplifies design and eliminates "cut-and-try". Charts show output impedance vs. input voltage for 9 tube types commonly used in cathode-follower circuits and give required resistor value. Diagrams, graphs.

475 Transistors. Theory and Application. IX. Grounded Emitter and Collector Circuits. Abraham Coblenz and Harry L. Owens. *Electronics*, v. 26, Nov. 1953, p. 166-172.

Design equations for additional transistor circuit configuration are derived. Relative advantages of various circuits for junction and point-contact transistors are discussed. Diagrams, tables. 4 ref.

476* Swinging-Coil Compensator for Recording Low Direct-Current Voltage Potentials. (German.) Erwin Samal. *Elektrotechnische Zeitschrift*, v. 74, no. 20, Oct. 11, 1953, p. 590-593.

Describes a self-rectifying compensator operated with a swinging-coil zero device which controls an amplifier tube. Design and application are discussed. Diagrams.

477* A General Purpose Electronic Analogue Computer. *Engineer*, v. 196, Sept. 25, 1953, p. 395-397.

Describes differential analyzer whose capacity is such that 3 computers coupled together should handle a 6-degrees-of-freedom problem. Photographs, diagrams.

478* Electronics in the Switching of Telephone Calls. L. J. Murray. *Engineering*, v. 176, Sept. 25, 1953, p. 413-415.

Describes automatic process of selecting and setting-up path to be used between any given pair of subscribers. Diagrams. (To be continued.)

13. *Electronics*

479* Electronic Controls. *Factory Management and Maintenance*, v. 3, Sept. 1953, p. 118-127.

Gives uses, care, and economy of electronic controls in industry. Photographs.

480* Laclede Applies McIlroy Network Analyzer to Design Calculations for Distribution System. Edwin F. Trunk. *Gas Journal*, v. 179, Sept. 1953, p. 14-15, 34.

Describes design and operation of analyzer. Photographs, diagram.

481 Radiation From a Vertical Electric Dipole Over a Stratified Ground. James R. Wait. *Institute of Radio Engineers, Transactions, Professional Group on Antennas and Propagation*, v. AP-1, no. 1, July 1953, p. 9-11. (TK1 In6.6t)

Expressions for low frequency fields are derived. Diagrams.

482 A Two-Dimensional Microwave Luneberg Lens. G. D. M. Peeler and D. H. Archer. *Institute of Radio Engineers, Transactions, Professional Group on Antennas and Propagation*, v. AP-1, no. I, July 1953, p. 12-23. (TK1 In6.6t)

A model was constructed using the TE_{10} mode. Experimental patterns agree with computations in the 2 principal planes. Photographs, graphs, tables.

483 Air-Core Coil Design for Crossover Networks. Albert Meyer. *Institute of Radio Engineers, Transactions, Professional Group on Audio*, v. AU-1, no. 5, Sept.-Oct. 1953, p. 9-11.

Investigation was made to determine proper wire size and optimum dimensions for an inductor to have a specified d.c. resistance and inductance. Graphs.

484 The Selection and Amplification of UHF Television Signals. Wilson P. Boothroyd and John Waring. *Institute of Radio Engineers, Transactions, Professional Group on Broadcast Television Receivers*, PGMTR-3, June 1953, p. 5-14. (TK1 In6.6t)

Diagrams, graphs.

485 A Four-Gun Tube for Color Television Receivers. John L. Rennick and Charles H. Heuer. *Institute of Radio Engineers, Transactions, Professional Group on Broadcast and Television Receiver*, PGBTR-3, June 1953, p. 40-46. (TK1 In6.6t)

Discusses some aspects of a 4-color tube of the aperture mask type. Diagrams.

486 Color Television. A Primer on the National Television System Committee System. William Feingold. *Institute of Radio Engineers, Transactions, Professional Group on Broadcast and Television Receivers*, PGBTR-4, Oct. 1953, p. 30-37. (TK1 In6.6t)

Shows that the fundamental make-up of the signal is easily understood, efficient, and ingenious. Diagrams. 4 ref.

487 Comparative Study of Modulation Methods. R. M. Page. *Institute of Radio Engineers, Transactions, Professional Group on Communications Systems*, v. CS-1, no. 1, July 1953, p. 13-22. (TK1 In6.6t)

Interprets communication theory in terms of physical concepts. Diagrams, graphs.

488 Long-Range Communication Trends. Murray G. Crosby. *Institute of Radio Engineers, Transactions, Professional Group on Communications Systems*, v. CS-1, no. 1, July 1953, p. 41-53. (TK1 In6.6t)

Long-range communications problem is briefly reviewed with respect to ionosphere transmission. Describes multipath transmission involved and various types of fading which result. Methods of reducing the different fading effects are discussed. Photographs, diagrams, tables.

489 Amplification of Microwave Radiation by Substances Not in Thermal Equilibrium. J. Weber. *Institute of Radio Engineers, Transactions, Professional Group on Electron Devices*, PGED-3, June 1953, p. 1-4. (TK1 In6.6t)

Briefly discusses possibility of obtaining coherent microwave radiation from crystals and gases.

490 Pulse Response of Junction Transistors. Norman H. Enenstein and Morgan E. McMahon. *Institute of Radio Engineers, Transactions, Professional Group on Electron Devices*, PGED-3, June 1953, p. 5-8. (TK1 In6.6t)

Discusses transient response of junction transistors. Experimental results are compared with theoretical relationships. Case for low load resistance, in which collector cutoff due to its capacitance does not occur, is considered. Treatment is confined to small-signal operation.

491 Hidden Regenerative Loop in Electronic Analog Computers. Louis G. Walters. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 2, 1953, p. 1-4. (TK1 In6.6t)

Presents a detailed analysis. Diagrams, graph. 3 ref.

492 Electrical Delay Lines for Digital Computer Applications. J. R. Anderson. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 2, 1953, p. 5-13. (TK1 In6.6t)

A survey of existing lumped and distributed parameter delay lines has shown that maximum storage capacity is about 23 and 15 pulses, respectively. Analysis indicates dissipation in the inductive elements is the chief factor limiting storage capacity. Method is proposed for decreasing dissipation. Graphs, diagrams, photograph. 3 ref.

493* Design of Triode Flip-Flops for Long-Term Stability. John O. Paivinen and Isaac. L. Auerbach. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 2, 1953, p. 14-26. (TK1 In6.6t)

Presents circuit design for best configurations of component values with "worst" condition of voltage and component tolerances. Diagrams.

494 A Photoelectric Decimal-Coded Shaft Digitizer. William H. Libaw and Leonard J. Craig. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 3, 1953, p. 1-4. (TK1 In6.6t)

Shows that a reliable dynamic shaft digitizer may be constructed by using phototubes and simple cylindrical masks to encode shaft positions. Photographs, diagrams, table.

495 An Analog-To-Digital Converter. A. D. Scarbrough. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 3, 1953, p. 5-7. (TK1 In6.6t)

A shaft position to binary number converter suitable for use as an input device for a digital computer is described. Diagrams, photographs.

496 The UNIVAC Tube Program. Thomas D. Hinkelman and Max H. Kraus. *Institute of Radio Engineers, Transactions, Professional Group on Electronic Computers*, v. EC-2, no. 3, 1953, p. 8-12. (TK1 In6.6t)

Shows that reliable performance of vacuum tubes in large scale computers can be achieved by design and tube selection and marginal checking. Graphs.

497 Machine Tool Control From a Digital-Analog Computor. Harry W. Mergler, George J. Moshos, and Allen E. Young. *Institute of Radio Engineers, Transactions, Professional Group on Industrial Electronics*, PGIE-1, Aug. 1953, p. 26-30. (TK1 In6.6t)

Photographs, diagrams.

498 Symposium on Microwave Circuity. *Institute of Radio Engineers, Transactions, Professional Group on Microwave Theory and Techniques*, v. MTT-1, no. 1, Mar. 1953, 48 p. (TK1 In6.6t)

Includes "A New Chart for the Solution of Transmission Line and Polarization Problems", Georges Deschamps; "Some Coupled-Wave Theory and Application to Waveguides (Abstract)", S. E. Miller; "Audio Modulation Substitution System for Microwave Attenuation Measurements", John Korewick; "The Microwave Interferometer for Measuring the Time Displacement of a Projectile Within the Barrel of a Gun (Abstract)", H. C. Hankd, Jr.; "Performance of Ferrites in the Microwave Range (Abstract)", A. G. Fox; "Microstrip—A New Microwave Transmission Technique (Abstract)", H. F. Engelmann; "X-Band Rotary Joint", H. J. Riblet and R. L. Williston; "Doubly Com-

pensated Tunable Cavity", T. S. Saad; "Compact Top-Wall Hybrid Junction", Eugene Hadge; "Duplexing Filter Design at 2000 Mc", D. R. Crosby; "A Standard Waveguide Spark Gap", David Dettinger and R. D. Wengenroth; and "A Rotary Joint for Two Microwave Transmission Channels of the Same Frequency Band (Abstract)", H. P. Raabe.

499 Transformer—Analogue Network Analysers. M. W. Humphrey Davies and G. R. Slemon. *Institution of Electrical Engineers, Proceedings*, v. 100, pt. 2, no. 77, Oct. 1953, p. 469-486.

Describes use of voltage transformers as complex quantities in a network analyzer. Negative resistance and unilateral mutual inductance are easily introduced. Can be applied to solving linear simultaneous equations. Graphs, diagrams, table. 8 ref.

500 A Digital Automatic Multiple-Point Pressure-Recording System. Elmer M. Sharp, Bert A. Coss, and Leonard Jaffe. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 236-241.

Discusses a system which records multiple pressures in digital form. Pressures are converted to a digital form at the primary transducer and subsequently the readings are handled in a numerical form. Graphs, tables, photographs.

501 Mechanized Data Handling. Joseph H. Rawlings. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 245-247.

Discusses mechanized data handling system consisting of engine instrumentation digital pressure- and temperature-recording instruments, tape-to-card conversion machinery, punch card operated electronic calculator (IBM 604), and associated card handling machinery. Diagram. 2 ref.

502 Fundamentals of Digital Computer Programming. Walker H. Thomas. *I.R.E. Proceedings*, v. 41, Oct. 1953, p. 1245-1249.

Describes simplified stored-program digital computer to demonstrate the above. Basic techniques are illustrated. Diagrams, tables. 13 ref.

503 SEAC. Sidney Greenwald, R. C. Haueter, and S. N. Alexander. *I.R.E. Proceedings*, v. 41, Oct. 1953, p. 1300-1312.

Gives comprehensive view of electronic digital computer located at National Bureau of Standards in Washington, D. C. Photographs, diagrams, tables.

504 Recovery Currents in Germanium *p-n* Junction Diodes. R. C. Shulman and M. E. McMahon. *Journal of Applied Physics*, v. 24, Oct. 1953, p. 1267-1272.

Describes proposed mechanism for the large transient current which flows during "recovery time" when germanium *p-n* junction biased in the forward direction has a reverse voltage suddenly applied. Photograph, tables, diagrams, graphs. 3 ref.

505* Technical Developments. A Special Purpose Digital Computer. J. P. Walker, Jr. *Mathematical Tables and Other Aids to Computation*, v. 7, no. 43, July 1953, p. 190-195.

Gives design considerations of computer for solution of simultaneous linear equations. Photographs, diagram. 4 ref.

506* A New Analogue Computor. E. Lloyd Thomas. *Mechanical World and Engineering Record*, v. 133, Oct. 1953, p. 462-467.

Describes design, operation, and applications of instrument arising out of computation requirements of aircraft design. Photographs, diagrams, graphs.

507 National Bureau of Standards Western Automatic Computer. *National Bureau of Standards, Technical News Bulletin*, v. 37, Oct. 1953, p. 145-150.

Describes recent developments and operating experience. Photographs.

508 Project Tinkertoy. Modular Design of Electronics and Mechanized Production of Electronics. *National Bureau of Standards, Technical News Bulletin*, v. 37, Nov. 1953, p. 161-170.

Describes an automatic set-up to manufacture, assemble, and test electronic modules from raw or semi-processed materials. Photographs, diagram.

509 A Diode-Capacitor Memory for High-Speed Electronic Computers. *National Bureau of Standards, Technical News Bulletin*, v. 37, Nov. 1953, p. 171-173.

Describes a system which can be designed to present in excess of 100,000 randomly located 50-digit words per second. Photographs, diagrams.

510 Semiconducting Intermetallic Compounds. *National Bureau of Standards, Technical News Bulletin*, v. 37, Nov. 1953, p. 174-175.

Discusses recent work on Hall effect and conductivity in GaSb, AlSb, CdSb, and InSb. Photographs.

511 A Bidirectional Electronic Counter for Use in Optical Interferometry. Franklin H. Branin, Jr. *Optical Society of America, Journal*, v. 43, Oct. 1953, p. 839-848.

Describes design and use of counting circuit. Discusses applications of circuit in interferometry and in analog-to-digital conversion devices. Diagrams. 27 ref.

512 A Large-Screen Television Projector. J. Haantjes and C. J. van Loon. *Philips Technical Review*, v. 15, July 1953, p. 27-34.

Describes above as suitable for presentation in theaters. Photographs, diagrams. 13 ref.

513* Microwave Control Pump Stations. R. C. Cheek. *Pipe Line News*, v. 25, Oct. 1953, p. S4, S6, S8, S10, S12.

Discusses equipment requirements, reliability considerations, and alarm functions. Diagram. 3 ref.

514* Transistors Portend Second Industrial Revolution? *Plant*, v. 8, Sept. 1953, p. 55.

Describes types and uses. Photographs.

515 Color TV—The NTSC System. Marvin H. Kronenberg. *Radio-Electronics*, v. 24, Nov. 1953, p. 30-32.

Describes compatible system similar to RCA "dot-sequential" method. Diagrams.

516* Extended Class A Amplifier. Lloyd B. Hust. *Radio & Television News*, v. 50, Sept. 1953, p. 40-42, 146-148.

Describes 50 watt amplifier using 4 beam power tubes in push-pull parallel circuits. Diagrams, photographs.

517* Electronic Counter. Erwin Levey. *Radio & Television News*, v. 50, Sept. 1953, p. 43-45, 114.

Describes adaptable basic counter unit. Diagrams, photographs.

518* Keyed A.G.C. Systems. Milton S. Kiver. *Radio & Television News*, v. 50, Sept. 1953, p. 48-50.

Describes typical keyed automatic gain control circuits and how they operate to increase TV receiver noise immunity. Diagrams.

519* Break-In Without Relays. Bruce F. Brown. *Radio & Television News*, v. 50, Sept. 1953, p. 55, 132.

Describes all-electronic system. Diagram, photograph.

520* U.H.F. Test Equipment Adapter. Dan Lerner and Winston Starks. *Radio & Television News*, v. 50, Sept. 1953, p. 56-57.

Describes unit to adapt V.H.F. signal or sweep generator to U.H.F. measurements. Diagrams.

521* A Square-Wave Shaper. George Ellis Jones, Jr. *Radio & Television News*, v. 50, Sept. 1953, p. 63, 116, 118.

Describes design, construction, and operation of an audio test unit which can be used in conjunction with a sine-wave generator. Diagrams.

522* A Transistorized Audio Oscillator. Louis E. Garner, Jr. *Radio & Television News*, v. 50, Sept. 1953, p. 68-69.

Describes miniature test unit which requires neither batteries nor power lines. Diagrams, photographs.

523* Automatic Input Switching Without Relays. Allen M. Ferres. *Radio & Television News*, v. 50, Sept. 1953, p. 70-71, 128, 130.

Gives construction details on a novel input control circuit. Diagrams, photographs.

13. *Electronics*

524* A Multi-Band, Constant Impedance Antenna. Calvin R. Graf. *Radio & Television News*, v. 50, Sept. 1953, p. 72, 104.

Describes simple modified "dipole" antenna usable on all bands related to the fundamental frequency in steps of 1, 2, 4, 8, 16, etc. Graphs, diagram.

525* Speech Filters for Amateur Receivers. Hector E. French. *Radio & Television News*, v. 50, Sept. 1953, p. 74, 124-125.

Essential "intelligence" audio frequencies are emphasized and much interference rejected by a receiver speech filter. Diagram, photographs.

526 High Quality at Low Cost. Lothar Stern. *Radio & Television News*, v. 32, Oct. 1953, p. 54-56.

Describes construction details of a compact, single-chassis, 10-watt amplifier built of standard, non-critical parts. Photographs, diagrams, graphs.

527* Electronics at Work on EJ&E. *Railway Age*, v. 135, Oct. 19, 1953, p. 78-82, 129.

Describes automatic retarder control system based not only on weight of cars but also on speed. Speed is measured by electronic ultra-high frequency radiation using the Doppler effect. Photographs, diagrams.

528* Electronic and Magnetic Control Methods for Continuous and Reversible Hot-Rolling Mills. (German.) Gustav Lemcke. *Stahl und Eisen*, v. 73, no. 18, Aug. 27, 1953, p. 1156-1162.

Describes methods of control of stand drives. Discusses electronic time-lag relays for auxiliary drives. Diagrams, graphs, photographs. 11 ref.

529 Generating Nonlinear Functions With Linear Potentiometers. Harold Levenstein. *Tele-Tech*, v. 12, Oct. 1953, p. 76-78, 177-180.

Reports that flexibility of new circuit technique makes possible its use for military fire control and computing systems. Diagrams, tables.

530 Transistor Oscillators. Hans E. Hollmann. *Tele-Tech*, v. 12, Oct. 1953, p. 82-83, 171-175.

Reports experimental and analytical results of investigation of transistorized Hartley circuit. "Circular frequency multiplication" permits V.H.F. operation. Photograph, diagrams, graphs. 3 ref.

531 Evaluation of High-Performance Magnetic Core Materials. I. Siegfried R. Hoh. *Tele-Tech*, v. 12, Oct. 1953, p. 86-89, 154-156.

Selection of proper material for a desired application is facilitated by a "figure of merit." Suitability of ferrites for high frequencies is shown. Graphs, diagrams, tables. (To be continued.)

532 "Carcinotron"—Backward Wave Microwave Oscillator. Edward C. Dench. *Tele-Tech*, v. 12, Nov. 1953, p. 64-66, 157-165.

Presents elementary theory of backward wave oscillator with transverse magnetic field. Reports advantages of power output of 100 watts at microwave frequencies, high efficiency, electronic tuning over wide band, and insensitivity to load variations. Photographs, graphs, diagrams. 12 ref.

533 Transistor Transient Response. J. J. Suran and F. Chow. *Tele-Tech*, v. 12, Nov. 1953, p. 67-69, 120, 122, 124, 126.

Reports that physical considerations in high-frequency and transient analysis show how equivalent circuits may be utilized to maximum within limitations of initial assumptions. Diagrams. 7 ref.

534 Design Factors That Extend Electron Tube Life. John H. Wyman. *Tele-Tech*, v. 12, Nov. 1953, p. 80-81.

Reports results of field tests which show effect of environmental conditions on tube reliability. Graphs.

535 Waveguides for UHF Television. J. S. Brown. *Tele-Tech*, v. 12, Nov. 1953, p. 82-83, 170.

Economic analysis of transmission line installation and operating expenses indicated that low waveguide attenuation offsets high initial costs. Photographs, graph, table.

536* Testing 2K56 Klystron Tubes. A. W. Dickey. *Western Union Technical Review*, v. 7, Oct. 1953, p. 137-144.

Describes testing procedure and equipment. Photographs, diagrams, graphs, table. 3 ref.

537 Fine Tungsten and Molybdenum Wire for Electron Tubes. I. C. C. Gee. *Wire Industry*, v. 20, Oct. 1953, p. 977-978, 980-981.

Give general survey of properties and applications of fine W and Mo wire as applied to electron tube manufacture. Photographs, tables. 3 ref. (To be continued.)

538* Matching Discontinuities in Waveguides. J. C. Parr. *Wireless Engineer*, v. 30, Oct. 1953, p. 243-249.

Discusses determination and combination of reflection coefficients, and procedures for matching fixed and movable terminations. Diagrams. 3 ref.

539* Transistors. IX. Complementary Symmetry and Its Application in Circuits for Television Reception. Thomas Roddam. *Wireless World*, v. 59, Oct. 1953, p. 475-478.

Includes diagrams.

540* More Valves for Microwaves. II. Velocity Modulation of the Electron Beam. *Wireless World*, v. 59, Oct. 1953, p. 479-483.

Discusses velocity modulation of electron beams in magnetrons, klystrons, and traveling-wave tubes. Diagrams.

541* A Method of Amplifying Extremely Small Thermoelectric Voltages. (German.) Werner Kroebel. *Zeitschrift für angewandte Physik*, v. 5, no. 8, Aug. 1953, p. 286-291.

Describes highly accurate arrangement. Diagrams. 6 ref.

Books and Miscellaneous Publications

542 Signal, Noise and Resolution in Nuclear Counter Amplifiers. A. B. Gillespie. 155 p. 1953. McGraw-Hill, New York. (QC787.C6 G41s)

Presents a concise account of factors which determine the signal to noise ratio and resolution in nuclear counter amplifiers. Includes theoretical and experimental data.

543 Fields and Waves in Modern Radio. Simon Ramo and John R. Whinnery. 2nd Ed. 576 p. 1953. John Wiley and Sons. (TK6553 R14f)

The applied electromagnetic theory essential for an understanding of modern radio and its related problems.

See also:
698 (computers for data handling systems)
774 (electronic controls for aircraft)

14. ENGINEERING ECONOMICS

544* Supply and Consumption of Oils and Fats. R. A. Duncan. *American Oil Chemists' Society, Journal*, v. 30, Sept. 1953, p. 358-360.

Includes tables.

545 Research and Natural Gas. John F. Foster. *Battelle Technical Review*, v. 2, Oct. 1953, p. 106-110.

Discusses expanding supplies, transportation, storage problems, and uses. Graphs.

546* Atomic Power as a Risk Venture. Karl Cohen. *Bulletin of the Atomic Scientists*, v. 9, Oct. 1953, p. 305-308.

Discusses economic feasibility of atomic energy as a power source.

547* How Corporate Treasurers View Bank Relationships. Harry V. Odle. *Burroughs Clearing House*, v. 37, Sept. 1953, p. 38-39, 92-100.

Gives financial officers viewpoint on bank investment and policy for large corporations.

548* How Corporate Treasurer View Bank Relationships. II. *Burroughs Clearing House*, v. 37, Oct. 1953, p. 38-39, 86, 88, 90, 92-94.

Gives opinions of various treasurers on bank officers' calls, lending rates, policies, and unusual services.

549 Operate for Maximum Profit. K. M. Mayer. *Chemical Engineering*, v. 60, Sept. 1953, p. 214-216.

Shows that minimum unit cost does not guarantee highest profit. Graphs.

550* Analyzing the Economic Cycles. Geoffrey H. Moore. *Dun's Review and Modern Industry*, v. 62, Oct. 1953, p. 64-66, 117-118, 120, 122, 124.

Describes methods of approach to forecast business trends. Graphs, tables, photographs.

551* The Trend of Business. *Dun's Review and Modern Industry*, v. 62, Oct. 1953, p. 79, 81, 84, 86, 88, 90, 93.

Discusses production, prices, trade, and finance. Graphs, tables.

552* Constructions Costs. 1952-53. *Engineering News-Record*, v. 151, Oct. 8, 1953, p. 79-206.

Report covers cost and price indexes; materials and unit prices; wage, work injury, compensation insurance, and equipment rental rates; and costs of financing. Graphs, tables, photographs.

553 Packaging Materials. *Food Engineering*, v. 25, Oct. 1953, p. 115-118, 196, 197.

Reports developments in reducing retail store operating costs by means of improved prepacking methods and materials.

554* Which Cigaret? *Forbes*, v. 72, Sept. 15, 1953, p. 16-19.

Presents data on relative costs of advertising and cigarette consumption growth in the various tobacco companies. Tables.

555 A Program for Cost Reduction. Bruce Payne. *Harvard Business Review*, v. 31, Sept.-Oct. 1953, p. 71-82.

Discusses strategy management might use in decreasing production costs.

556 Should Industry Move South? John O. Tomb. *Harvard Business Review*, v. 31, Sept.-Oct. 1953, p. 83-90.

Discusses economic considerations applicable to relocation of industry. Tables.

557 Current Research on Heat Resistant Cast Alloys as Related to Nickel Conservation. Ernest A. Schoefer. *Industrial Heating*, v. 20, Oct. 1953, p. 1973, 1974, 1976, 1978, 1980, 1982, 2108-2113.

From an examination of past and present trends, predicts a nickel scarcity in future. Photographs, diagrams, graphs, tables. 3 ref.

558 Economy in Metal Finishing. S. Wernick. *Institute of Metal Finishing, Transactions, Advance Copy* no. 12, v. 29, 1953, 8 p. (TS670 E25j)

Discusses ways of preventing increasing costs in metal finishing industry. Warns against danger of "shortcuts."

559* The Export Market for Capital Goods. *International Markets*, v. 7, Sept. 1953, p. 24-29.

Presents analysis of machinery and equipment export trends. Tables.

560* Accelerated Amortization and Regulatory Policy. Edward Neuner, Jr. *Land Economics*, v. 29, Aug. 1953, p. 248-262.

Discusses mechanics of accelerated amortization, regulatory policy and technique, consumer versus investor appropriation of tax gains, and a proposal for sharing tax amortization benefits. Table.

561* The British Brewing Industry. Arthur Seldon. *Lloyds Bank Review*, 1953, no. 30, Oct., p. 30-44.

Discusses location and ownership of breweries, derivations of raw materials, wholesale and retail distribution, and consumption.

562* World Reserves and Production of Manganese Ores. (German.) W. Gehr. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 729-738.

Presents data on ore classification, mineralogy, world reserves, markets, evaluation of ores, deposits, and production in Europe, Russia, Asia, Africa, the Americas, and Australia. Tables. 11 ref.

563 Analysis and Correlation of Test Data. Irving W. Burr. *Metal Progress*, v. 64, Oct. 1953, p. 112-118, 282-284.

Discusses technique and advantages of applying statistical methods to the analysis of test data. Graph, table, photographs.

564 Input-Output Relations of Steel-Using Industries. *Monthly Business Review*, v. 35, Oct. 1953, p. 2-11.

Presents an analysis portraying in quantitative terms the nature of the inter-industry transactions which are characteristic of the nation's business. Tables, diagrams.

565 Short Cut Estimating of Processes. J. F. Gilmore, Jr. *Petroleum Refiner*, v. 32, Oct. 1953, p. 97-101.

Discusses methods and data. Photographs, diagrams, data.

566* Grand Haven Thrives With More Diesels. J. Bryan Sims. *Power*, v. 97, Nov. 1953, p. 75-77.

Describes equipment, plant layout, and operational advantages including fuel and space economy. Photographs, tables.

567* Profits. How High Are They? *Power*, v. 97, Nov. 1953, p. 102A-102B.

Compares corporation profits today with record of previous years and with their share of the total national income. Graph, tables. (To be continued.)

568* Some Mathematical Methods and Techniques in Economics. I. N. Herstein. *Quarterly of Applied Mathematics*, v. 11, Oct. 1953, p. 249-262.

Presents some phases of pure mathematics in current use in economics. 54 ref.

569 The Oil Well Drilling Contractor Industry. A Case Study in Pure Competition. John E. Hodges and L. Cookenboo, Jr. *Rice Institute Pamphlet*, v. 40, July 1953, 98 p. (AP1 R36)

Presents an empirical examination of an industry which exhibits many of the characteristics of pure competition. Its primary purpose is to provide evidence that may assist in the evaluation of public policies which have as their goal the reconstruction of a purely competitive economy. 49 ref.

570 Sets of Three Measurements. W. J. Youden. *Scientific Monthly*, v. 77, Sept. 1953, p. 143-147.

Shows statistical value of more than 1 determination, fallacy of using the closest 2 out of 3 determinations, and application of statistics for data of greater value. 4 ref.

571* Economic Review. W. Leroy Neubrech. *Southern Pulp and Paper Manufacturer*, v. 16, Oct. 10, 1953, p. 12, 14, 16.

Reports economics trends in pulp and paper industry thus far in 1953 and predicts continuing favorable production rate. Table, graphs.

572 Petroleum Refineries, Including Cracking Plants, in the United States, January 1, 1953. J. G. Kirby. *U. S. Bureau of Mines, Information Circular* 7667, Sept. 1953, 12 p. (TN21 Un3i)

Reports of individual states with petroleum refineries show a total of 343 plants with a total daily crude oil throughput capacity of 7,638,661 barrels. Tables.

573 Estimate of Known Recoverable Reserves of Coking Coal in Somerset County, Pa. Joseph J. Wallace, James J. Dowd, John A. Bowsher, R. F. Abernethy, and D. A. Reynolds. *U. S. Bureau of Mines, Report of Investigations* 4998, Aug. 1953, 20 p. (TN21 Un3r)

Graphs, tables.

574* Gold. The Canadian Viewpoint. V. C. Wansbrough. *Western Miner and Oil Review*, v. 26, Oct. 1953, p. 44-50.

Discusses economics of Canadian industry.

14. *Engineering Economics*

Books and Miscellaneous Publications

575 Economic Development of Ceylon. International Bank for Reconstruction and Development. 829 p. 1953. Johns Hopkins Press, Baltimore. (HC497.C4 In8e)

A thorough and detailed report on Ceylon's economic potentialities, setting forth recommendations for a 6 year development program to meet the needs of the growing population and add permanent strength to the economy.

See also:

328 (painting costs)
384 (economics of water power)
401 (power rates)
623 (gasification costs)
781 (forecasting uses of Cu, Pb, and Zn)
857 (shell molding costs)
884 (economic utilization of Cu-base alloys)
1048 (cost of fabricating Ti)
1202 (cost of power generated by atomic energy)
1274 (cost of producing molded plastics)
1295 (world demand for rubber)
1321 (heat pump costs)
1342 (savings by air conditioning)

15. FLUID MECHANICS

576 Measurement of Flow. *Canadian Chemical Processing*, v. 37, Sept. 1953, p. 100-102, 104, 105.

Covers differential head meters, positive displacement meters, and constant head on area meters. Table, diagrams, graphs.

577 Liquid-Film Properties for Centrifugal Spray Nozzles. M. Doumas and R. Laster. *Chemical Engineering Progress*, v. 49, Oct. 1953, p. 518-526.

Velocities and film thickness of liquid sheets issuing from nozzles at different pressures were determined. Correlation with nozzle dimensions is established. Photographs, diagrams, graphs, tables. 7 ref.

578 Transition Flow of Fluids in Smooth Tubes. V. E. Senecal and R. R. Rothfus. *Chemical Engineering Progress*, v. 49, Oct. 1953, p. 533-538.

Describes laminar-turbulent transition for air. Data in the lower Reynolds number range agree with other studies. Diagram, graphs. 10 ref.

579* Vortex Motion in Viscous Fluids Studied in Apparatus Consisting of Concentric Glass Cylinders. H. A. Einstein and Huon Li. *Civil Engineering*, v. 23, Sept. 1953, p. 51.

Describes apparatus to measure fluid flow. Diagram, photographs.

580* Slow Unsteady Flow of a Viscous Liquid Around a Sphere. (Russian.) B. V. Rusanov. *Doklady Akademii Nauk SSSR*, v. 90, no. 1, May 1953, p. 41-44

Presents expressions for velocity components of axisymmetric flow.

581* Flowmeter With Adjustable Segment Shutter. (German.) Walther Wunsch and Fritz Herning. *Gas- und Wasserfach*, v. 94, Ausgabe Gas, no. 17, Sept. 1, 1953, p. 479-500.

Describes new flowmeter for water and compressed air. Tables, diagrams, graphs, photographs. 7 ref.

582* Present Status of Knowledge Pertaining to Pipe Friction. (German.) Otto Kirschmer. *Gas- und Wasserfach*, v. 94, Ausgabe Wasser, no. 16, Aug 15, 1953, p. 209-213.

Presents basic formulas and physical basis of Prandtl's formulas. Graphs, diagrams. 6 ref. (To be continued.)

583* Principle of Industrial Hydromechanics. IV. (German.) Paul Böss. *Gas und Wasserfach*, v. 94, Ausgabe Wasser, no. 18, Sept. 15, 1953, p. 526-528.

Discusses two-dimensional flow of water under different conditions. Diagrams, graph.

584 Temperature Gradients in Turbulent Gas Streams. Behavior Near Boundary in Two-Dimensional Flow. S. D. Cavers, N. T. Hsu, W. G. Schlinger, and B. H. Sage. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2139-2145.

Includes tables, graphs. 20 ref.

585 Radiation-Conduction Correction for Temperature Measurements in Hot Gases. W. E. West, Jr. and J. W. Westwater. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2152-2156.

Develops an equation for correct temperature determinations using a probe. Diagrams, graphs. 20 ref.

586 Flow Problems With Respect to Intakes and Tunnels of Swedish Hydro-Electric Power Plants. I. Conditions of Flow at Intakes to Some Swedish Hydro-Electric Power Plants. II. Flow of Water Discharged Through a Vertical Overflow Pipe. III. Friction Losses in Unlined Swedish Rock Tunnels. Lennart Rahm. *Kungl. Tekniska Högskolans Handlinger* (Transactions of the Royal Institute of Technology, Stockholm, Sweden), 1953, no. 71, 214 p. (T4 K96t)

Photographs, graphs, tables, diagrams. 112 ref.

587 Note on the Electric anud the Diamagnetic Susceptibilities of Compressed Gases. (English.) B. R. A. Nijboer. *Physica*, v. 19, no. 5, May 1953, p. 454-456.

Discusses the collective behavior of atoms in a non-polar dielectric and considers the individual behavior of one atom in a highly compressed medium. 10 ref.

Books and Miscellaneous Publications

588 Fluid Dynamics. American Mathematical Society. Proceedings of Symposia in Applied Mathematics, v. 4, 86 p. 1953. McGraw-Hill. (QA1 Sy68p)

A reference volume for engineers, mathematicians, and physicists who are interested in the mathematical treatment and applications of fluid dynamics.

589 Heat Transfer and Fluid Mechanics Institute, Preprints of Papers. 292 p. 1953. Stanford Univ. Press. (QC320 H35p)

Includes "Heat and Mass Transfer from Slender Cylinders to Air Streams in Axi-Symmetrical Flow", Harold H. Sogin and Max Jakob; "Heat Transfer in the Compressible Turbulent Boundary Layer on a Flat Plate", Constantine C. Pappas and Morris W. Rubesin; "Experimental Investigation of Heat Transfer at Hypersonic Mach Number", R. D. DeLauer and H. T. Nagamatsu; "Unsteady Interaction of Disturbances With a Shock Wave, With Applications to Turbulence and Noise", H. S. Ribner and F. K. Moore; "Temperature Measurements in the Wake of Bodies in Supersonic Flow", A. H. Lange; "A Study of Shock Wave Turbulent Boundary Layer Interaction", Seymour M. Bogdonoff; "Turbulent Forced Convection Heat Transfer in Circular Tubes Containing Molten Sodium Hydroxide", Herbert W. Hoffman; "Free Convection in Electric Fields", K. H. Weber and G. H. Halsey; "Heat Transfer in Curved Flow Channels", Frank Kreith; "Heat Transfer Associated with Nucleate Boiling", Warren M. Rohsenow; "The Formation of Bubbles at Simple Orifices", R. R. Hughes, A. E. Handlos, H. D. Evans, and R. L. Maycock; "Factors That Influence Heat Transfer in Boiling", Reinhold F. Larson; "Evaporation From Liquid Wall Films Into a Turbulent Gas Stream", Eldon L. Knuth; "On the Normal Shock Wave in any Single Phase Fluid Substance", S. J. Kline and A. H. Shapiro; "Open Channel Flow of Water-Aair Mixture", H. A. Einstein and O. Sibul; "One-Dimensional Velocity Variation of a Burning Droplet", C. C. Miesse; "Present Status of Cavitation Research", Robert T. Knapp; and "Recent Advances and Current Problems in the Theory of Flame Propagation", Martin Summerfield.

16. FOOD TECHNOLOGY

590 Application of Ion Exchange Chromatography to Study of Amino Acid Composition of Foods. (French.) E. Schram, J. P. Dustin, S. Moore, and E. J. Bigwood. *Analytica Chimica Acta*, v. 9, no. 2, Aug. 1953, p. 149-162.

Discusses procedure for above. Diagrams, table. 21 ref.

591* X-Ray Examination for the Detection of Internal Insect Infestation in Corn. J. Frank Nicholson, O. L. Kurtz,

and Kenton L. Harris. *Association of Official Agricultural Chemists, Journal*, v. 36, Aug. 15, 1953, p. 993-1001.

Shows that X-ray examination correlates well with cracking flotation results and is faster. Photographs, table. 7 ref.

592 Proteins of Marine Algae. C. B. Coulson. *Chemistry & Industry*, 1953, no. 38, Sept. 19, p. 997-998.

Determined by chromatography. Table. 20 ref.

593 Cold Sterilization. W. M. Urbain. *Food Engineering*, v. 25, Oct. 1953, p. 86, 236, 238.

Discusses processing of food with β-, γ-, X- or cathode-rays to destroy spoilage organisms.

594 Ultrasonic Processing. *Food Engineering*, v. 25, Oct. 1953, p. 87.

Describes growing list of applications such as measuring viscosities of liquids, homogenizing and emulsifying, precipitating solids from liquids, and gaging liquid levels.

595* The Effect of Bacteria on the Color of Prepackaged Retail Beef Cuts. O. D. Butler, L. J. Bratzler, and W. L. Mallmann. *Food Technology*, v. 7, Oct. 1953, p. 397-400.

Reports that bacteria commonly found on meats caused discoloration. Graphs. 21 ref.

596 Instrumentation for Food Processing. Dean Foster. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 5-7.

Describes psychological techniques for measurements of essential qualitative and quanitative properties of food and beverages. The use of appropriate psychological measures will facilitate development of a program for measuring physicochemical variables. Photographs.

597* Experiments With Submerged Culture. S. S. Block, T. W. Stearns, R. L. Stephens, and R. F. J. McCandless. *Journal of Agricultural and Food Chemistry*, v. 1, Sept. 30, 1953, p. 890-893.

The possibility of growing mushroom mycelium in submerged culture was investigated because of the large quantities of low-cost potential growth media available in Florida in the form of citrus press water. The mycelium, when prepared as a food, lacks the true mushroom flavor; however, because of its bland taste it might be useful for pharmaceutical concentrates of B vitamins and amino acids. Diagrams, photographs, tables. 21 ref.

598* Dehydrated Foods. Chemistry of Browning Reactions in Model Systems. John E. Hodge. *Journal of Agricultural and Food Chemistry*, v. 1, Oct. 14, 1953, p. 928-943.

Reviews investigations of above during past three years. Tables, diagrams. 21 ref.

599* Trends in Food Packaging Technology. *Journal of Agricultural and Food Chemistry*, v. 1, Oct. 28, 1953, p. 978-986.

Reviews an ACS symposium of 17 papers on the above. Role of plastics is emphasized. Photographs, diagrams, graphs.

600 Electronic Sterilization of Foods. R. S. Hannan. *Research*, v. 6, Oct. 1953, p. 376-383.

Summarizes developments in techniques by ionizing radiation. Tables, graphs, photographs. 22 ref.

See also:
339 (effects of Al on foods)
553 (packaging of food)

17. FUELS AND COMBUSTION

601* Definitions of Terms. *American Gas Journal*, v. 179, Oct. 1, 1953, p. 16-128.

Defines terms and presents technical information on fuels and gases. Graphs, tables.

602 An Investigation of the Burning Characteristics of Pulverized Cinders. J. M. Allen. *ASME, Transactions*, v. 75, Oct. 1953, p. 1333-1337.

Discusses effects of excess air fineness of pulverization, furnace temperatures, and extent of preheat. Results of these tests are useful in designing equipment needed to burn cinders in locomotive firebox. Diagrams, tables, graphs.

603* The Conditions of Gasification in the Operation of Generators With Preheated Forced Down-Draft Installed in Gas Plants. (German.) Gerhard Lorenzen. *Brennstoff-Chemie*, v. 34, nos. 17-18, Sept. 1953, p. 281-283.

Describes new grateless generator for gas-plant ovens. A gas of high B.t.u. value with practical and economic advantages was obtained. Graphs, diagrams. 6 ref.

604* Firing Experiments With Powdered Coke. (German.) H. Winter and R. Jüterbock. *Brennstoff-Wärme-Kraft*, v. 5, no. 9, Sept. 1953, p. 297-303.

Discusses equipment and methods for burning coke dust in steam generators. Results prove feasibility of powdered coke as fuel. Photographs, diagrams, graphs, tables. 4 ref.

605 The Testing of Coal for Coke Making. I. R. A. Mott, chairman. *British Coke Research Association, Technical Paper, no.* 1, 1948, 13 p. (TP336 B77t)

Discusses determination of moisture, ash, volatile matter, crucible swelling number of coal, and S content in coal and coke. Diagrams.

606 A Study of the Pressures Developed by British Coals During Carbonisation. W. Idris Jones, chairman. *British Coke Research Association, Technical Paper no.* 2, 1948, 69 p. (TP336 B77t)

Investigates pressures developed during carbonization of a wide range of coals from British coalfields. Photographs, tables, diagrams, graphs. 22 ref.

607 Coal Blending for Carbonisation in Coke Ovens (Including the Utilisation of Materials Other Than Coking Coal). H. L. Riley, chairman. *British Coke Research Association, Technical Paper no.* 4, 1950, 23 p. (TP336 B77t)

Describes practical aspects of blending coal as applied to coke oven operation in United Kingdom. Diagrams, tables. 11 ref.

608 Further Studies of Coking Pressure. W. Idris Jones, chairman. *British Coke Research Asociation, Technical Paper no.* 5, 1952, 51 p. (TP336 B77t)

Discusses influence of bulk density and rate of heating. Describes tests to determine effects of blending and presents application of internal pressure measurements to coke oven practice. Tables, graphs, photographs, diagrams. 12 ref.

609* How Industry Wastes Fuel and How It Can Be Saved. *Chemical & Process Engineering*, v. 34, Oct. 1953, p. 326-327.

Summarizes report by Anglo-American Council on Productivity.

610* Explanation of Low-Temperature Carbonizing Process in Kosag-Geissen Furnace. (German.) W. Greber and O. Johansen. *Chemische Technek*, v. 5, no. 8, Aug. 1953, p. 425-432.

Cause of cracking in heating and conductor coils is investigated. Questions regarding unusual coke and tar yields are discussed. Graphs, tables. 3 ref. (To be continued.)

611 Burning Velocity Determinations. X. Flame Propagation Along Horizontal Tubes. M. F. Hoare and J. W. Linnett. *Faraday Society, Transactions*, v. 49, Sept. 1953, p. 1039-1049.

Reports studies of passage of flame through various ethylene and air mixtures in cylindrical tubes. Diagrams, tables, graphs. 13 ref.

612* Studies in Coke Formation and Properties. P. L. Agrawal, F. Fitzgerald, and R. J. Sarjant. *Fuel*, v. 32, Oct. 1953, p. 397-414.

Determines specific surface of brights and durains of a number of coals of varying rank by a gas adsorption method using argon at −183°. Diagrams, tables, graphs. 30 ref.

613* Differential Thermal Analysis of Coal. J. B. Stott and O. J. Baker. *Fuel*, v. 32, Oct. 1953, p. 415-427.

oxidizing atm. Tables, graphs, diagram. 6 ref.
Describes method of investigating thermal reaction of coal in

17. *Fuels and Combustion*

614* Reactivity of Solid Fuels. Influence of Oxygen Partial Pressure. H. L. Weisz and A. A. Orning. *Fuel*, v. 32, Oct. 1953, p. 435-440.

Describes effect of oxygen partial pressure in the range from 0.2 to 1.0 atm., upon self-heating rates in 7 coals and 8 cokes. Empirical kinetic equations are presented. Tables, graphs. 5 ref.

615* Some Relations of Rank and Rate of Heating to Carbonization Properties of Coal. J. A. Dulhunty and B. L. Harrison. *Fuel*, v. 32, Oct. 1953, p. 441-450.

Describes physical behavior of coal during thermal decomposition with particular reference to volume change, development of plasticity and coherency, and formation of ultra-fine structure. Diagram, graph, tables.

616* Studies on the Spontaneous Ignition of Fuels Injected Into a Hot Air Stream. VI. Ignition Delay Measurements on Organic Compounds Containing Nitrogen or Halogen. VII. Ignition Delay Measurements on Alcohol and Ethers. VIII. Ignition Delay Measurements on Aldehydes, Ketones, Esters, Cyclo-Compounds, Heterocylic Compounds and Carbon Disulphide. B. P. Mullins. *Fuel*, v. 32, Oct. 1953, p. 451-492.

Includes graphs, tables.

617 Recent Investigations in Coal Chemistry. II. (Japanese.) Wataru Hunasaka, Shigeru Kajiyama, and Sohei Suga. *Fuel Society of Japan, Journal*, v. 32, no. 312, Apr. 1953, p. 228-238.

A review covering the period 1946 to 1950. Includes oxidation, pyrolysis, carbonization, and hydrogenation. 160 ref.

618* X-Ray Diffraction Data of Japanese Coals. (Japanese.) Katsuya Inouya, Hideo Tani, and Mitsuo Abiko. *Fuel Society of Japan, Journal*, v. 32, no. 313, May 1953, p. 292-298.

Studies were made using powder techniques with Cu radiation. Presents details of method and results from 34 domestic coals. Graphs. 10 ref.

619* Some Properties of Amakusa Anthrcites. (Japanese.) Sadao Iki and Yoshijiro Hosokawa. *Fuel Society of Japan, Journal*, v. 32, no. 313, May 1953, p. 299-304.

Reports analysis of 10 different coals. Map, graphs, tables. 8 ref.

620* An Improved Design for High Capacity Line Burners. W. M. Dow and Burnie Porter. *Gas*, v. 29, Sept. 1953, p. 41-45.

Describes development of design and operating characteristics. Photographs, graphs, tables.

621* Results of Commercial Tests of Selective H_2S Absorbent. F. E. Miller and A. L. Kohl. *Gas*, v. 29, Sept. 1953, p. 101, 104-106.

Discusses requirements of absorbent and gives results of tests. Graphs, table, diagram. 9 ref.

622* The Onia-Gegi Process. N. J. Robertson and H. C. Harrison. *Gas Journal*, v. 275, Sept. 23, 1953, p. 770-773.

Describes plant layout, equipment, and procedure for gasification of heavy oil. Tables, diagram.

623* Fuel Oil Gasification by the Onia-Gegi Process. N. J. Robertson and H. C. Harrison. *Gas Times*, v. 76, Sept. 18, 1953, p. 921-922, 924.

Gives characteristics of oils used and gas produced; operating data; and cost figures. Diagram, tables.

624* Coal-Gas Wet Purification. (German.) Ernst Terres. *Gas- und Wasserfach*, v. 94, Ausgabe Gas, no. 9, May 1, 1953, p. 261-265.

Describes different methods of purification and utilization of NH_3 and H_2S during the process. Graphs. 9 ref. (To be continued.)

625* The New Gas Coking Plant "Grasbrook." (German.) Georg Düwel. *Gas- und Wasserfach*, v. 94, Ausgabe Gas, no. 17, Sept. 1, 1953, p. 483-491.

Describes design of new coal-distilling plant in Hamburg. Graph, diagrams, photographs.

626 Influence of Hydrogen Sulfide on Flame Speed of Propane-Air Mixtures. Philip F. Kurz. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2361-2366.

H_2S was found to inhibit flame speed more than its concentration would suggest. Proposes that inhibition is the result of intermediate formation by S_2. Diagrams, tables, graphs. 10 ref.

627 Explosion Hazards in Ovens and Furnaces From Over-Rich Combustion. J. B. Smith and E. H. Jones. *Industrial Heating*, v. 20, Oct. 1953, p. 1938-1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1966.

Describes conditions existing in operation of a continuous stable burner flame which could cause an explosion. Recommends means of minimizing them. Graphs, diagrams. (To be continued.)

628 Flame Radiation Research Joint Committee: Reports of Burner Trials at IJmuiden. I. Introduction. M. W. Thring. **II. Purpose and Practical Consequences of the Trials. III. A Classification of Oil-Burner Types,** G. J. Gollin. **IV. Droplet Size Measurements on Various Steel Furnace Oil Burners.** J. R. Royce. **V. The Efficiency of Momentum Production by Fluid-Atomizing Burners,** R. D. Collins, G. H. Mayer, and M. P. Newby. **VI. Control of the Independent Variables and Supplies to the Experimental Furnace,** G. W. Van Stein Callenfels and G. H. Mayer. and **VII. Description of Trials and Results.** R. Mayorcas and M. Riviere. *Institute of Fuel, Journal*, v. 26, Oct. 1953, p. 189-224.

Includes photographs, diagrams, graphs, tables. 11 ref.

629 Manufacture of Butane-Enriched Blue Water Gas on Small Undertakings. E. Johnson. *Institution of Gas Engineers, Copyright Publication no.* 416, 1952, 25 p. (TP700 In7.3c)

Details of plant and operating and utilization results are given. Costs are considered. Tables, graphs, diagrams.

630 Effect of Load Variation on Costs. J. Burns. *Institution of Gas Engineers, Copyright Publication no.* 417, 1952, 24 p. (TP700 In7.3c)

Discusses selection of most suitable and economical types of gas production plants. Tables, graphs.

631 Expansion of a Horizontal Chamber Setting. J. Southworth. *Institution of Gas Engineers, Copyright Publication no.* 428, 1953, 25 p. (TP700 In7.3c)

Describes survey to compare restrained expansion laterally and longitudinally with free expansion vertically; determine effectiveness of expansion spaces; and determine whether manual adjustment of buckstays could be carried out satisfactorily without pressure-measuring instruments. Graphs, tables. 5 ref.

632* How D&RGW Uses Low-Cost Fuel. *Railway Age*, v. 135, Oct. 19, 1953, p. 83-85.

Discusses use of treated non-specification diesel fuel resulting in savings of about $20,000 a month. Photographs, table.

633 Low Grade Fuel Can Be Burned Without Smoke. John Fox. *Smokeless Air*, v. 24, Autumn, 1953, p. 24-27, 46.

Economics of the above, some fallacies on cost of control, and combustion equipment are discussed. Photographs, diagram.

634* Evaluation of Fuel Oil to Avoid Breakdowns. Quantitative Methods of Determining the Water Content in Fuel Oil. (German.) K. O. Hahnel. *Sprechsaal*, v. 86, no. 19, Oct. 1953, p. 475-477.

Discusses calorific value, specific gravity, viscosity, solidification point, coking tendency, S and H_2O content, and effect of changing types of fuel oil. Tables, graph. 5 ref.

635* Gasol, A New Member of the Fuel Family. (Norwegian.) Arvid Hedberg. *Teknish Ukeblad*, v. 100, no. 36, Oct. 1, 1953, p. 779-784.

Discusses calorific value and use in industry. Describes physical properties. Tables.

636. Effect of Pressure on the Smoking Tendency of Diffusion Flames. Rose L. Schalla and Glen E. McDonald. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53E05, Sept. 17, 13 p. (TL782 Un3rm)

Discusses variation in smoke formation among hydrocarbon fuels over pressure range of 1/2 to 12 atm. Graphs, diagram, tables. 5 ref.

637 Minimum Spark-Ignition Energies of 12 Pure Fuels at Atmospheric and Reduced Pressure. Allen J. Metzler. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53H31, Oct. 29, 1953, 28 p. TL782 Un3rm)

Minimum ignition energies are related to pressure, quenching distance, and maximum fundamental flame velocity of the fuel-air mixture. Graphs, diagrams, tables. 12 ref.

Books and Miscellaneous Publications

638 Concise Handbook of Fuels and Combustion Technology. Wilhelm Gumz. 2nd Rev. Ed. 583 p. 1953. Springer-Verlag, Berlin. (TP318 G95k2)

Deals with properties, compositions, and refining of solid, liquid, and gaseous fuels. Discusses principles and problems of combustion under a variety of conditions.

See also:
140 (blending coal for carbonization)
1182 (utilization of coal)

18. GEOLOGY AND MINERALOGY

639* Diamond as an Industrial Material. (German.) P. Grodzinski. *Archiv für technisches Messen*, 1953, no. 212, Sept., p. 215-216.

Discusses crystal structure and physical properties of different types of diamonds. Table. 21 ref.

640* Physical and Crystallographical Properties of Some Spinels. F. C. Romeijn. *Philips Research Reports*, v. 8, Aug. 1953, p. 304-320.

Includes graphs, tables. (To be continued.)

641* Clay Rocks and Their Deposits. II. Geochemical Considerations of Clay and Kaolin. (German.) Hans Vetter. *Sprechsaal*, v. 86, no. 14, July 1953, p. 345-348.

Discusses above. Tables, graph, micrograph. (To be continued.)

642* The Crystalline Structure of Iodine. (Russian.) A. I. Kitaigorodskii, T. L. Khotsianova, and Iu. T. Struchkov. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 6, June 1953, p. 780-781.

Describes above. Diagrams.

19. GEOPHYSICS

643 Seismic Model Study. E. T. Howes, L. H. Tejada-Flores, and Lee Randolph. *Acoustical Society of America, Journal*, v. 25, Sept. 1953, p. 915-921.

Describes method which has been developed for studying seismic sound pulses in reduced scale models which simulate geophysical seismic exploration methods. Diagrams, photographs, graphs. 2 ref.

644 Propagation Measurements in the Ionosphere With the Aid of Rockets. J. Carl Seddon. *Journal of Geophysical Research*, v. 58, Sept. 1953, p. 323-335.

Describes daytime measurements of electron and ion densities, electron collision frequency, and earth's magnetic field made during V-2 rocket flights. Graphs. 7 ref.

Books and Miscellaneous Publications

645 Astrophysics. The Atmospheres of the Sun and Stars. Lawrence H. Aller. 412 p. 1953. Ronald Press Co., N. Y. (QB61 A154a)

Contains an introduction to basic astronomical data and an account of the physical laws required for an interpretation of stellar atmospheres and interiors. Subjects treated include atomic structure and spectra; gas laws and velocity distribution; ionization; excitation; dissociation of atoms and molecules; and selected aspects of radiation theory.

646 Man in Space. Heinz Haber. 281 p. 1953. Bobbs-Merrill, New York. (TL789 H1lm)

Medicine, physics, astronomy, and psychology are pooled to portray man's environment in space, to show how he will react and how he may be protected.

647 Conference on the Sun in the Service of Man. Harlow Shapley, chairman. 326 p. 1951. American Academy of Arts and Sciences. (QC911 C76)

Includes papers covering the biological utilization of solar energy, sun-earth relationships, and survey of energy sources, needs, and utilizations.

20. GRAPHIC ARTS

648* Formation of Internal Centers as a Result of the Chemical Maturing of the Photographic Emulsion. (Russian.) K. V. Chibisov and I. M. Ratner. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 329-332.

Discusses above during recrystallization with the introduction of hydrazine and hyposulfite. Graphs. 6 ref.

649 Film Synchronizer for Aerial Cameras. Herbert E. Meinema. *Electronics*, v. 26, Nov. 1953, p. 135-137.

Describes phototube-controlled servo system which measures aircraft ground speed and adjusts camera film transport to keep film and image moving at same rate. Diagrams, photograph. 1 ref.

650* The Kodak-Magenta-Masking Process for Color Reproduction. (German.) *Fachhefte für die Chemigraphie, Lithographie und den Tiefdruck*, 1953, no. 3, p. 72-79.

Describes the process. Table, diagrams, graph.

651* Photoengraving Review. II. J. S. Mertle. *Graphic Arts Monthly*, v. 25, Oct. 1953, p. 28, 34, 36, 38, 40.

Discusses color reproduction and diverse applications.

652* The Importance of Screen Prepartion. J. I. Biegeleisen. *Graphic Arts Monthly*, v. 25, Oct. 1953, p. 72, 74, 76, 90.

Discusses importance of the screen on register, sharpness of printing, smoothness, and cost of paint consumption.

653* Helpful Color Measurements. Frank Preucil. *Graphic Arts Monthly*, v. 25, Oct. 25, 1953, p. 100, 102, 104, 106, 108.

Describes use of reflection densitometers to check printed color-ink strength.

654* Plate Graining and Preparation. II. W. H. Grealey. *Modern Lithographer and Offset Printer*, v. 9, Sept. 1953, p. 20, 22, 25.

Discusses design of graining machine and the graining process. Photographs, table. (To be continued.)

655* Safety. *Modern Lithography*, v. 21, Sept. 1953, p. 36-38, 117, 119.

Excerpts from "Safety Manual for the Graphic Arts Industry" by Miss Lillian Stemp, published by the National Safety Council and the Education Council of the Graphic Arts Industry, Inc. Discusses safety in lithographic plants. Graph.

656* Full Color Offset Newspaper Production. II. T. W. Brown. *Modern Lithography*, v. 21, Oct. 1953, p. 79, 82, 84, 85.

Reports use of offset lithography to produce ROP Color and newspaper supplements. Photographs.

657* Electroplating in Lithography. G. N. Martin. *National Lithographer*, v. 60, Oct. 1953, p. 60-62.

Discusses copper-chromium, copper-stainless steel, and copper-aluminum plates; brush plating for correction and repair; and preparation of press rollers.

20. *Graphic Arts*

658 Gloss Measurements: The Design of Glossmeters. V. G. W. Harrison. *Oil & Colour Chemists' Association, Journal,* v. 36, Oct. 1953, p. 569-579; disc., p. 579-588.

Summarizes main conclusions resulting from extended investigation into gloss of paper surfaces. Discusses bearing of these conclusions on design of glossmeters for general and specialized purposes. 3 ref.

659 Studies in the Resolving Power of Photographic Emulsions. VI. The Effect of the Type of Pattern and the Luminance Ratio in the Test Object. Fred H. Perrin and J. H. Altman. *Optical Society of America, Journal,* v. 43, Sept. 1953, p. 780-790.

Resolving-power test-object patterns were compared with the tricolumnar type. Tables, graphs. 29 ref.

660 Psychometric Evaluation of the Sharpness of Photographic Reproductions. Robert N. Wolfe and Fred C. Eisen. *Optical Society of America, Journal,* v. 43, Oct. 1953, p. 914-922.

Reports that by repeated evaluations, scale values obtained by this method were a reliable indication of sharpness attribute. Tables, photographs, diagram, graphs. 6 ref.

661* The ABC of Offset. XIV. Color Corrective Techniques. George Jos. Lenzer. *Printing Equipment Engineer,* v. 83, Sept. 1953, p. 46-47.

Discusses chemical procedures, reduction, and intensification. (To be continued.)

662* Inks for Rotogravure Printing. I. Axel Lundbye. *Printing Equipment Engineer,* v. 83, Sept. 1953, p. 50, 66.

Discusses composition and usage of types of inks. Diagrams. (To be continued.)

663* Silk Screen Mechanization. Victor Strauss. *Printing Equipment Engineer,* v. 83, Sept. 1953, p. 60-62, 64-65.

Compares screen process printing with letterpress, offset, and gravure. Discusses major techniques in process. Diagrams.

664* Paper Properties as Related to Printability. I. William H. Bureau. *Printing Equipment Engineer,* v. 83, Sept. 1953, p. 66-67, 73.

Includes diagrams. (To be continued.)

665* The ABC of Offset. XV. Color Correcting Continuous Tone Negative. George Jos. Lenzer. *Printing Equipmnet Engineer,* v. 84, Oct. 1953, p. 54, 67-68, 70-71.

Discusses stains and emulsions, methods of testing condition of emulsion, and corrective measures. (To be continued.)

666* New Printing Developments. J. Homer Winkler. *Printing Magazine,* v. 77, Oct. 1953, p. 56-58.

Reports that increased support of research activities by graphic arts industries has contributed to technical advances from phototypesetting to screen process printing. Photographs.

667 Techniques in Underwater Photography. John F. Storr. *PSA Journal,* v. 19, Sept. 1953, p. 22-27.

Diagrams, graphs, photographs.

668* Silver Azide-Gelatin Emulsion. (German.) J. Eggert and R. Zemp. *Zeitschrift für Naturforschung,* v. 8b, no. 8, Aug. 1953, p. 389-395.

Describes experiments with AgN_3 to find most favorable development conditions for emulsions poured over paper and glass. Grain sizes of AgCl and AgN_3 were compared. Graphs, tables. 8 ref.

669* Investigation of the Mechanism of Preparing Photographic Emulsions. II. Relation Between the Processes of the Change of Photosensitivity, Size of the Film, and Formation of Silver During Preparation. (Russian.) A. A. Mikhailova, I. M. Ratner, A. A. Titov, and K. V. Chibisov. *Zhurnal Fizicheskoi Khimii,* v. 27, no. 6, June 1953, p. 866-877.

Graphs, table. 14 ref.

Books and Miscellaneous Publications

670 Photometry. John W. T. Walsh. 2nd Ed. 544 p. 1953. Constable & Co., London. (QC391 W16p2)

Covers chapters on "Historical Note", "Radiation", "The Eye and Vision", "Photo-Electric Cells", "The Principles of Photometry", "Standards and Sub-Standards", "The Measurement of Luminous Intensity", "Light Distribution and Total Flux Measurements", "Heterochromatic Photometry", "Colorimetry", "Spectrophotometry", "Illumination and Luminance", "The Measurement of Reflection, Transmission and Absorption Factors", "Photometry of Projection Apparatus", "Stellar Photometry", and "The Photometric Laboratory."

See also:
1207 (nuclear emulsions)
1325 (press room air conditioning)

21. HEAT POWER

671* Afterburners—Are They Worth While? Floyd C. Newton. *Aeronautical Engineering Review,* v. 21, Oct. 1953, p. 42-47.

Compares turbojets with or without afterburning as applied to aircraft performance. Graphs. 4 ref.

672* Supersonic Ram-Jet Performance. J. Lukasiewicz. *Aircraft Engineering,* v. 25, Oct. 1953, p. 298-306.

Considers ideal and practical performance tests including effects of combustion, temperature, altitude, intake, and exhaust nozzle design. Diagrams, tables, graphs. 9 ref.

673* A Comparsion of Propellants and Working Fluids for Rocket Propulsion. Krafft A. Ehricke. *American Rocket Society, Journal,* v. 23, Sept.-Oct. 1953, p. 287-296, 300.

Compares a series of chemical propellants and thermonuclear working fluids, covering a wide range of density-specific impulse values, with respect to vehicle performance and design parameters. Tables, graphs. 6 ref.

674* High-Frequency Combustion Instability in Rocket Motor With Concentrated Combustion. Luigi Crocco and Sin-I Cheng. *American Rocket Society, Journal,* v. 23, Sept.-Oct. 1953, p. 301-313, 322.

Includes graphs. 7 ref.

675* Measurements in Compressors and Gas Turbines. III. Measurement of Temperature and Efficieney. (German.) Wilfried Oesterlin. *Archiv für technisches Messen,* 1953, no. 211, Aug., p. 179-182.

Discusses temperature measurement and inuence of errors. Photographs, graphs, diagrams. 50 ref.

676 Calculation of Transpiration-Cooled Gas-Turbine Blades. J. N. B. Livingood and E. R. G. Eckert. *ASME, Transactions,* v. 75, Oct. 1953, p. 1271-1278.

Discusses methods for analytic determination of local coolant flow required to maintain constant prescribed wall temperature.

677 Analysis Bares J47 Jet Design Details. *Aviation Week,* v. 59, Oct. 26, 1953, p. 27-28, 30, 35, 36, 38, 40, 42, 44.

Includes diagrams, photographs, table.

678 Report on Sparkplug Meeting: Experts Study Misfiring, Fouling. George L. Christian. *Aviation Week,* v. 59, Oct. 26, 1953, p. 58, 60, 63, 64, 66.

Describes new developments in use of TCP (tricresyl phosphate), anti-fouling addition for fuels. Photograph.

679* Development of a Gas Turbine Combustion Chamber for Powdered Coal. (German.) Herbert R. Hazard. *Brennstoff-Chemie,* v. 34, nos. 17-18, Sept. 1953, p. 266-274.

Discusses development for locomotive application. Tables, graphs, diagrams, photographs. 7 ref.

680* Boiler Availability. *British Coal Utilization Association, Quarterly Gazette,* no. 18, p. 6-11.

Describes effects of sulphur in coal on boiler operation. Sulphur trioxide and volatile alkli compounds form a cement to block passageways and sulphur trioxide plus water causes acid corrosion. Discusses instrumentation, analysis, etc. Studies on pulverized coal have started. Photographs, graphs.

681* The Pametrada Marine Gas Turbines. *Engineering*, v. 176, Oct. 16, 1953, p. 491-493, 496.

Describes development of a 3500 hp. unit to operate competititively on fuel oil. Photographs, diagrams, graphs.

682* Tests of a Furnace for a Coal Burning Turbine. D. L. Mordell, R. E. Chant, and W. R. Foster-Pegg. *Engineering Journal*, v. 36, Sept. 1953, p. 1122-1130.

Enumerates various methods of coal utilization; discusses furnace design; describes equipment used for tests; and gives test data and results. Diagrams, photographs, tables, graphs.

683 Gas Turbines and the Chemical Industry. W. D. Armstrong. *Industrial Chemist and Chemical Manufacturer*, v. 29, Oct. 1953, p. 435-442, 450.

A review of applications and advantages of above. Diagrams, graphs. 11 ref.

684* Symposium on Engine Testing of Lubricating Oils. *Institute of Petroleum, Journal*, v. 39, Aug. 1953, p. 501-580.

Presents following articles: "Some Aspects Involved in the Evaluation of Engine Lubricating Oils", N. Kendall et al; "Lubricating Oil Requirements for Passenger Transport and Long-Distance Haulage", A. T. Wilford; "Military Requirements for Lubricating Oils for C. I. Engines", D. I. Baddeley, R. W. Eggleston, R. W. Long, and A. Watson; "Notes on Heavy Duty Oils. Some Experiences of a Diesel Engine Manufacturer", D. M. Pearce; "A Short Duration Lubricating Oil Test on a Multi-Cylinder C. I. Engine", A. Fogg and G. R. Oliver; and "The Caterpillar L.1 and Chevrolet L.4 Test Procedures", J. C. Cree. Graphs, photographs, tables. 24 ref.

685 Application of the Gas Turbine for Recovery of Waste Heat. W. Gregson. *Institution of Gas Engineers, Copyright Publication no.* 415, 1952, 23 p. (TP700 In7.3c)

Discusses possibilities of adopting the gas turbine for recovery of waste heat in the carbonizing industry. Diagrams.

686* Injection Characteristics and Diesel Knock. A. J. Davies. *Institution of Mechanical Engineers, Automotive Division, Proceedings*, pt. 4, 1951-52, p. 214-219.

Reports effect of quantity and timing of pilot charge on cylinder pressure diagram and examines influence of these factors on ignition delay and maximum rate of increase of cylinder pressure. Diagrams, graphs, photographs.

687 Instrumentation for Detonation Research. W. J. Levedahl. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 343-347.

Describes instrumentation which has been developed or adapted to study the auto-ignition characteristics of engine fuels. Photographs, diagrams. 4 ref.

688* Large Steam Engines Chosen for Generator, Compressor Drives. *Plant*, v. 8, Sept. 1953, p. 38-40.

Discusses Corliss valves and uniflow engines. Photographs.

689 Curb That Jet Appetite for Fuel. J. G. Borger. *SAE Journal*, v. 61, Oct. 1953, p. 17-19.

Excerpts from paper "Meeting the Jet Transport Challenge" presented at Metropolitan Section of SAE, New York City, March 5, 1953. Discusses improvement of jet fuel economy. Tables.

690 The Gas Turbine. Lawrence P. Lessing. *Scientific American*, v. 189, Nov. 1953, 65-72.

Reports new applications in trucks, locomotives, and stationary power plants. Photographs, diagrams.

691* Turbo-Compound Engine. *Shell Aviation News*, 1953, no. 182, Aug., p. 20-22.

Describes an 18-cylinder radial piston engine with 3 turbines mounted so as to extract energy from the exhaust gases. Diagrams, tables.

692 Whirling Its Way Into New Fields. *Steel Horizons*, v. 15, Fourth quarter, 1953, p. 10-13.

Discusses use of gas turbine in industry today and predicts future applications. Photographs.

693 Effect of Blade-Thickness Taper on Axial-Velocity Distribution at the Leading Edge of an Entrance Rotor-Blade Row With Axial Inlet, and the Influence of This Distribution on Alinement of the Rotor Blade for Zero Angle of Attack. John D. Stanitz. *U. S. National Advisory Committee for Aeronautics, Technical Note* 2986, Aug. 1953, 33 p. (TL570 Un3t)

Discusses a method for estimating the variation in inlet axial-velocity distribution induced by blade taper in an entrance rotor-blade row. Graphs, table.

694 An Analysis of Turbojet-Engine-Inlet Matching. DeMarquis D. Wyatt. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3012, Sept. 1953, 19 p. (TL570 Un3t)

A method of presenting turbojet-engine air-flow requirements and inlet-system air-flow capacities in identical though independent parametric terms was developed. Graphs. 7 ref.

695 Influence of Rotor-Engine Torsional Oscillation on Control of Gas-Turbine Engine Geared to Helicopter Rotor. John C. Sanders. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3027, Oct. 1953, 40 p. (TL570 Un3t)

Calculations showed that torsional motion arising from the hinged construction of the blades contributed to the instability of the engine speed and engine torque controls. Graphs, diagrams, tables. 5 ref.

696* Combustion Engines for the Propulsion of Railroad Vehicles, Their Use and Economy. (German.) G. A. Gaebler. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 95, no. 27, Sept. 21, 1953, p. 933-943.

Discusses efficiency and economy of different gaseous, liquid, and solid fuels. Diagrams, tables, graphs. 15 ref.

Books and Miscellaneous Publications

697 The High Speed Internal-Combustion Engine. Harry R. Richardo. 4th Ed. 420 p. 1953. Blackie & Son, London. (TJ770 R35h4)

Covers research, design, and development work carried out during the last 35 years.

See also:
366 (corrosion in boiler air preheaters)
373 (boilers in electric power plants)
731 (lubrication of jet engines)
765 (jet engine fuel pumps)

22. INFORMATION—PREPARATION AND DISSEMINATION

698 Data Handling Systems Symposium. *Institute of Radio Engineers, Transactions, Professional Group on Instrumentation*, PGI-2, June 1953, 111 p. (TK1 In6.6t)

Symposium includes papers on "Problems in the Development of an Automatic Data Handling System at NOTS", E. E. Green; "Progress in Automatic Data Handling at Lewis Flight Propulsion Laboratory to N.A.C.A.", L. Jaffe; "Automatic Reduction of Wind Tunnel Data", V. S. Haneman; "The SADIC, A Precision Analog-Digital Converter", R. L. Sink and G. M. Slocomb; "E.R.A. Shaft-Position Analog-to-Digital Converter", G. W. Lund; "A Position Data Measuring System", A. F. Gowen; "A Binary Outscriber Using Facsimile Paper", W. H. Ware; "Design Considerations and New Developments in the 'Flying Typewriter'", J. J. Wild; "High Speed Printing Equipment", L. Rosen; "A Complete Telemetry System for the Flight Testing of Aircraft", F. E. Bryan; "A System for Recording Telemetered Data in Digital Form", D. J. Simmons and "Multi-Channel FM/FM Telemeter Data Handling System", C. P. Ballard. Photographs, diagrams, graphs.

23. INSTRUMENTATION AND LABORATORY APPARATUS

699 Some Observations on the Preece Test and Stripping Tests for Zinc-Coated Wires. G. A. Ellinger, W. J. Pauli, and T. H. Orem. *American Society for Testing Materials, Preprint no.* 3s, 1953, 11 p. (TA401 Am35p)

Describes investigation to determine validity of the Preece test under varying conditions. Graphs. 7 ref.

23. *Instrumentation and Laboratory Apparatus*

700* An Efficient Electro-Ultrafilter. Richard B. Johnson. *Applied Microbiology*, v. 1, Sept. 1953, p. 252-254.

Describes apparatus for quickly concentrating voluminous cellular extracts. Diagrams, graphs. 2 ref.

701 The Philosophy of Simulated Service Testing. S. A. Gordon. *ASTM Bulletin*, 1953, no. 193, p. 27-31; disc., 31.

Discusses development and standardization of test methods for simple or composite materials in actual or simulated service conditions and environmnets. Drawings.

702 Measuring Surface Roughness. *Canadian Metals*, v. 16, Oct. 1953, p. 66-67.

Describes electronic roughness tester, particularly suitable for workshop, which can be used for the above against chosen standards. Table, diagram.

703 An Electrolytic Remote-Indicating Manometer. John T. Stock and M. A. Fill. *Chemical Age*, v. 49, Sept. 19, 1953, p. 599-602.

Describes a simple, rugged, sensitive, easily-made instrument. Diagrams, graphs. 3 ref.

704* Measurement of Surface Temperature With Rolled-Out Thermocouple Elements. (German.) W. Nunner. *Chemie-Ingenieur Technik*, v. 25, no. 7, July 1953, p. 386-390.

Presents a simple arrangement. Annealing of wires after rolling permits continued use of original calibration curve without error. Graphs, photographs. 7 ref.

705* A Recording Viscosimeter for Flow Curves. (German.) Erich Helmes. *Chemie Ingenieur-Technik*, v. 25, no. 7, July 1953, p. 390-392, 393-394.

Describes device for fully automatic laboratory recording. Graphs, diagrams. 7 ref.

706 A Melting Point Apparatus Employing Batch Distillation Heating. J. S. Forsyth, J. T. Wood, and N. L. Franklin. *Chemistry & Industry*, 1953, no. 40, Oct., p. 1051-1053.

Describes experimental apparatus, techniques, and results. Tables, diagram.

707 Measurement of the Size-Distribution of Spray Particles. L. K. Wheeler and E. S. Trickett. *Electrical Engineering*, v. 25, Oct. 1953, p. 402-406.

Describes apparatus and its operating characteristics. Photograph, diagrams, graph. 8 ref.

708 Wide-Range Vacuum Gage. Clifton B. Sibley and Jonathan R. Roehrig. *Electronics*, v. 26, Nov. 1953, p. 176-177.

Describes linear cold-cathode radium-type gage which measures gas pressures from 1000 to 0.0001 millimeters of Hg absolute with consistent accuracy. Diagrams photographs. 4 ref.

709 Instrumentation for Pilot Plants. Clyde Berg. **Recorders and Controllers in Pilot Plant Instrumentation,** E. R. Roth and G. P Masologites. **Specialized Recorders and Controllers on Pilot Units.** C. H. McIntosh. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 1836-1852.

Photographs, diagrams, nomographs. 5 ref.

710 High Temperature Dilatometer. J. Baron. *Institut de Recherches de la Sidérurgie, Publication*, ser. A, no 59, July 1953, 8 p. Reprinted from *Société Francaise de Céramique, Bulletin*, Jan.-Mar. 1953, no. 18, p. 4-11. (TS300 In7p)

Describes apparatus for use up to 1800 C. Gives typical correction curves and data on various ceramic specimens. Tables, graphs, photograph, diagrams.

711 Use of Radio-Elements in Metallurgy. (French.) A. Kohn. *Institut de Recherches de la Sidérurgie, Publication*, ser. B, no. 20, June 1953, 22 p. Reprinted from *Documentation Métallurgique*, Jan., Feb., Mar., 1953, no. 13, p. 9-30. (TS300 In7p)

Summarizes methods used. Tables, micrographs. 79 ref.

712 Recent Advances in Radiation and Immersion Pyrometry. E. J. Burton. *Instruments*, v. 26, Oct. 1953, p. 1524-1525, 1550-1552.

Describes design and application of three new instruments. Tables, graphs, diagrams, photographs. 10 ref.

713 Design for a Modern Instrument Shop. G. L. Slocum. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 28-29.

Describes importance of instruments in modern refineries. Progress, modern designs, practices, and operating methods are discussed. Photograph.

714 Force Measurement on Balloon Plastics and Parachute Cloth by Means of Strain Gages. J. J. Ryan. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 47-49.

Graphs, photographs.

715 Radiation Pyrometry. T. J. Schlottenmier. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 102-111.

Discussion of the principles of radiation pyrometry, with emphasis of energy transfer considerations and factors affecting target size and definition. Diagrams, photographs. 3 ref.

716 Effect of Interaction Among Probes, Supports, Duct Walls and Jet Boundaries on Pressure Measurements in Ducts and Jets. Lloyd N. Krause and Clarance C. Gettleman. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 138-141.

Presents data showing the magnitude of the geometry and proximity effects for commonly used probes and their influence on flow conditions in circular ducts and jets. Graphs.

717 The Instrument Laboratory in Research. O. L. Linebrink and C. F. Lucks. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 293-297.

Reviews the instrument laboratory's place in industry and research. Includes a brief outline of the background and evolution of the instrument laboratory at Battelle Memorial Institute. Photographs.

718 Automatic Process Control. *Iron Age*, v. 172, Oct. 8, 1953, p. 273-320.

Gives reports on latest developments in the field, including gaging, sorting, heat treating, plating solution control, melting, rolling, welding, counting, weighing, and foundry practice.

719 Trajectories in the Symmetrical Electron Lens. L. Jacob and J. R. Shah. *Journal of Applied Physics*, v. 24, Oct. 1953, p. 1261-1266.

Gives factors relative to the design of electron lenses. Tables, diagrams, photographs, graphs. 11 ref.

720 An Electronic Temperature Controller. B. E. Noltingk and M. A. Snelling. *Journal of Scientific Instruments*, v. 30, Oct. 1953, p. 349-351.

Describes instrument in which thermistor, immersed in fluid system to be controlled, is connected in an a.c. Wheatstone bridge operated at 50 cycles per second. Diagrams, photograph. 8 ref.

721 Magnetic Electron Lens Aberrations Due to Mechanical Defects. G. K. Archard. *Journal of Scientific Instruments*, v. 30, Oct. 1953, p. 352-358.

Reports calculations of electron-optical aberrations due to mechanical defects in magnetic lens pole-pieces, by a slight modification of the computational procedure of Sturrock. Diagrams, graphs, table. 7 ref.

722 How Form Tolerances Affect Gaging Requirements. Earle Buckingham. *Machinery*, v. 60, Oct. 1953, p. 197-203.

Shows how profile tolerances are selected and how they determine gaging requirements. Diagrams.

723* Instrumentation in the Pulp and Paper Industry. Donald B. Scrivens. *Paper Mill News*, v. 76, Oct. 16, 1953, p. 49-50, 52-54, 142.

Discusses equipment for control of grinders, paper consistency, bleaching plant, and drying operations. Diagrams, photographs.

724 Electron Interferometry. L. Marton. *Science*, v. 118, Oct. 23, 1953, p. 470-474.

Discusses techniques and possible applications. Diagrams. 10 ref.

725* On the PbS Photoconductive Cell. Noboru Sassa and Masatoshi Nakamura. *Science of Light (Japanese)*, v. 2, Mar. 1953, p. 104-115.

Describes preparation of cells by the evaporation method. Graphs, diagrams.

726* Calibration of a Stormer Viscosimeter With Special Reference to Turbulent Flow Conditions. P. J. Van Der Walt and A. M. Fourie. *South African Chemical Institute, Journal*, new ser., vol. 6, no. 2, Sept. 1953, p. 36-48.

Known methods of calibration were found invalid in some situations. Best results were obtained from calibration curves comprising several related factors. Diagrams, tables, graphs. 5 ref.

727 Application of An Electro-Optical Two-Color Pyrometer to Measurement of Flame Temperature for Liquid Oxygen-Hydrocarbon Propellant Combination. M. F. Heidmann and R. J. Priem. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3033, Oct. 1953, 39 p. (TL570 Un3t)

Temperature variations up to 1000 R and emissivity variations of 10 to 1 were measured. The results of simultaneous measurements of sound intensity and temperature by the 2-color method and by a microwave absorption technique are also presented. Graphs, diagrams. 7 ref.

728 Measurement and Control of the Thickness of Thin Films. K. M. Greenland. *Vacuum*, v. 2, July 1952, p. 216-230.

Describes gravimetric, photometric, polarimetric, interferometric, X-ray, and electrical methods. Diagrams. 56 ref.

Books and Miscellaneous Publications

729 The Measurement of Particle Size in Very Fine Powders. H. E. Rose. 127 p. 1953. Constable & Co. Ltd. London. ((TA407 R71m)

Analyzes the basis of current trends of thought on the above, reports development in the field, and discusses the results of researches in progress.

See also:
357 (water meter design)
390 (surface roughness gage)
1146 (measuring devices)

24. LUBRICATION AND FRICTION

730 Boosters for Better Lubricants. D. Keith Jackson. *Canadian Chemical Processing*, v. 37, Sept. 1953, p. 56, 58.

Brief discussion of additives. Photographs.

731* Jet Engines and Their Lubrication. (Japanese.) Takezo Obata. *Fuel Society of Japan, Journal*, v. 32, no. 313, May 1953, p. 279-291.

Requirements are discussed. U. S. and British standards are described.

732 Pour Point Depression of Lubricating Oils. Gilbert Gavlin, Edwin A. Swire, and Sam P. Jones, Jr. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2327-2335.

Shows that *n*-alkyl acrylic polymers with at least 12 carbon alkyl chains prevent intercrystalline wax formation. Micrographs, graphs, tables. 14 ref.

733 Friction and Consumption Characteristics of Motor Oils. David Frazier, A. R. Klingel, and R. C. Tupa. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2336-2342.

Shows that oils with or without viscosity-index improver are consumed equally, but the oils with the improver permit much better gasoline mileage. Tables, graphs. 17 ref.

734* Use of the Petter AVl Diesel Engine for Testing Additive Treated Oils. A. Towle and P. E. B. Vaile. *Institute of Petroleum, Journal*, v. 39, Sept. 1953, p. 581-623.

Describes a rapid (120 hr.), simple test for comparing straight and treated oils. Results show reasonable agreement with the longer (480 hr.) Caterpillar L.1 test. Photographs, tables, graphs, diagrams.

735* The Evaluation of H.D. Oils by Means of Small Petrol Engines. G. H. J. Simmons. *Institute of Petroleum, Journal*, v. 39, Sept. 1953, p. 623-631.

Describes the Lauson engine for evaluating motor oils and correlation of data with that obtained in the Chevrolet and Caterpillar test engines. Tables.

736* The Testing of I.C. Engine Lubricating Oils by the Blogro Engine Under Spark and Compression Ignition Conditions. R. J. S. Perry. *Institute of Petroleum, Journal*, v. 39, Sept. 1953, p. 632-637.

Gives details of the engine and instructions for its use. Photographs, diagram.

737* The Development of an Inexpensive Engine Test for Examining the Bearing Corrosion and Detergency Aspects of Additive Lubricating Oils. C. O. R. Bell. *Institute of Petroleum, Journal*, v. 39, Sept. 1953, p. 638-675.

Describes substitution of Petter W.1 engines for the American Chevrolet L.4 tests on bearing corrosion. Statistics are used. Photographs, tables, graphs.

738 Lubrication in the Cutting of Metals. Antoni Niedzwiedzki. *Machinery (London)*, v. 83, Oct. 9, 1953, p. 717-721, 741.

Discusses functions and properties of lubricants. Describes effects of friction when cutting metals. Diagrams, photograph. 19 ref.

739* The Dry Lubrication of Moving Parts. P. H. Billington. *Mechanical World and Engineering Record*, v. 133, Oct. 1953, p. 468-471.

Discusses advantages and applications of colloidal graphite with and without fluid vehicle. Photographs, tables, diagrams.

740* Analysis of the Deterioration of Mobile Oil When Accompanied by Fuel Dilution. (English.) Noriaki Kadota. *Memoirs of the Faculty of Engineering, Kyoto University*, v. 15, no. 3, July 1953, p. 175-184.

Introduces an equation for the increase in viscosity of lubricant oil during use and fuel dilution. Tables, graphs. 4 ref.

741* Evaluating the Bearing Properties of Bearing Materials. XI. A Friction-Bearing Testing Machine for Stationary Loads. (German.) C. M. von Meysenbug. *Metall*, v. 7, nos. 19-20, Oct. 1953, p. 755-758.

Describes the MPA-Darmstadt friction-bearing testing machine which permits recording of friction, temperature, and stresses in bearings. Diagrams, photographs. 8 ref.

742* Evaluation of Bearing Materials by Present-Day Status of Experience. (German.) R. Kühnel. *Metall*, v. 7, nos. 19-20, Oct. 1953, p. 759-766.

Reviews literature on testing. Tables, graphs. 13 ref.

743* Lubrication of High-Speed Machines. *Overseas Engineer*, v. 27, Oct. 1953, p. 105-106.

Describes "Tecalemit-Bijur" system with particular reference to its application to a textile plant. Photographs, diagrams.

744 Study of Lubricant Flow in Bearings by Streak Photography. Frank J. Kolano. *Product Engineering*, v. 24, Oct. 1953, p. 162-163.

Includes photographs.

745 How to Hit a Homer in the Bearing-Design League. E. Crankshaw and R. C. Savage. *SAE Journal*, v. 61, Oct. 1953, p. 26-30.

Based on paper "Latest Engineering Techniques in the Bearing Industry," presented at meeting of the SAE, Chicago, Feb. 10, 1953. Discusses importance of bearing materials, oil grooving, clearance, and housing design.

746* Turbine Oils and Turbine Lubricating Oil Systems. G. H. Clark. *Scientific Lubrication*, v. 5, Oct. 1953, p. 12-14, 16-19.

Discusses mechanics of turbine lubrication and problems related to maintenance of quality of the oil. Corrosion is considered. Photographs, diagram.

24. *Lubrication and Friction*

747* Oleodieseling. I. Maxwell Smith. *Shell Aviation News*, 1953, no. 183, Sept., p. 8-9.

Discusses spontaneous ignition temperatures of oils, greases, and special petroleum products used in aircraft. Diagram, table, graph.

748 Comparison of Operating Characteristics of Four Experimental and Two Conventional 75-Millimeter-Bore Cylindrical-Roller Bearings at High Speeds. William J. Anderson, E. Fred Macks, and Zolton N. Nemeth. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3001, Sept. 1953, 27 p. (TL570 Un3t)

Discusses tests on various design combinations to determine best over-all performance. Graphs, diagrams, photograph, tables. 13 ref.

749 Effect of Bronze and Nodular Iron Cage Materials on Cage Slip and Other Performance Characteristics of 75-Millimeter-Bore Cylindrical-Roller Bearings at DN Values to 2X10^6. William J. Anderson, E. Fred Macks, and Zolton N. Nemeth. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3002, Sept. 1953, 24 p. (TL570 Un3t)

Reports little difference between bronze and nodular iron cages as measured by bearing temperature, heat dissipation to oil, and bearing wear at 16,000 r.p.m. Tables, diagrams, graphs. 13 ref.

750 Investigation of 75-Millimeter-Bore Deep-Groove Ball Bearings Under Radical Load at High Speeds. II. Oil Inlet Temperature, Viscosity, and Generalized Cooling Correlation. Zolton N. Nemeth, E. Fred Macks, and William J. Anderson. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3003, Sept. 1953, 33 p. (TL570 Un3t)

Discusses determination of inner- or outer-race bearing temperature and power rejected to the oil. Graphs, photographs, tables. 12 ref.

751 Components of Wire Drawing Lubricants. Leon Salz. *Wire and Wire Products*, v. 28, Oct. 1953, p. 1056-1058, 1125.

Discusses various components and their purposes in lubricants. Photograph, table.

See also:
85 (lubricants for WC bearings)
684 (testing of lubricating oils)
985 (effect of lubricants on bearing wear)
991 (apparatus for testing lubricants)

25. MECHANICAL ENGINEERING

752 Cast Iron Brake Drums. E. C. Toghill and H. T. Angus. *Automobile Engineer*, v. 43, Oct. 1953, p. 409-418.

Describes developments in design and materials to cope with problems of heat dissipation and drum distortion. Photographs, diagrams.

753 Unconventional All-Plastic Valve Solves Corrosion Problems. Oliver M. Hahn. *Chemical Engineering*, v. 60, Sept. 1953, p. 234.

A simple, direct, efficient, sliding valve is illustrated.

754* Axle Design and Failures. George W. McArd. *Diesel Railway Traction*, v. 7, Oct. 1953, p. 225-234.

Includes diagrams, charts, photographs.

755* The Aerodynamics of Compressor Blade Vibration. H. Pearson. *Engineer*, v. 196, Oct. 9, 1953, p. 473-476.

Discusses causes and shows that in unstalled region, damping is almost entirely aerodynamic. Graphs, diagram. 1 ref.

756 The Automatic Factory. *Fortune*, v. 48, Oct. 1953, p. 168-171, 178, 180, 185, 187, 188, 190, 195.

A round table discussion by 16 industrial experts. Photographs.

757* Automatic Transmissions in America. Charles A. Chayne. *Institution of Mechanical Engineers, Automobile Division, Proceedings*, pt. 1, 1952-53, p. 9-15.

Discusses evolution in design and construction of the above. Table, diagrams, photographs.

758 Automatic Electronic Controllers for Vibration Testing of Structural Members. J. S. Brown and A. C. Gannett. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 178-182.

Two automatic electronic controllers are described. Photographs, tables, diagrams.

759 Elimination of Defects in Metallurgical Plant. J. S. Caswell. *Iron and Steel Institute, Special Report no.* 48, Jan. 1953, p. 7-15.

Discusses correct and efficient design of plant and machine parts; methods of experimental stress analysis; plant manufacture and erection; and plant operation. Photographs, diagrams. 6 ref.

760* Low Temperature Hydraulic Operations. *Lubrication*, v. 39, Oct. 1953, p. 121-128.

Discusses properties of petroleum-base hydraulic oils and the various elements of hydraulic circuits which affect low-temperature hydraulic operation. Graphs, tables, photographs, diagrams

761 Designing Springs. II. Stanley L. Albright. *Machine Design*, v. 25, Oct. 1953, p. 222-226.

Describes how to achieve simplification and reduce costs. Diagrams.

762 Condensed Review of Some Recently Developed Materials. *Machinery*, v. 60, Oct. 1953, p. 169-187.

Gives tabular information on material, trade name, properties, applications, and names and addresses of manufacturers of products.

763 Steel Fabricating Plant. *Machinery Lloyd (Overseas Ed.)*, v. 25, Oct. 10, 1953, p. 107-109.

Discusses equipment, plant layout, and operating procedure. Photographs.

764 Design Features of a High Pressure, Single Stage, Rotary Vane Hydraulic Pump-Motor. John R. English. *National Conference on Industrial Hydraulics, Proceedings, 8th Meeting*, v. 6, 1952, p. 78-87. (TC160 N21R)

Discusses operating principle of some units now available. Describes operating principle and design features of a new type unit that may be used interchangeably as a pump or fluid motor without alteration of internal parts at pressures to 2000 psi. Diagrams, graphs.

765 Jet Engine Fuel Pumps. J. A. Lauck. *National Conference on Industrial Hydraulics, Proceedings, 8th Meeting*, v. 6, 1952, p. 121-127. (TC160 N21R)

Graphs, photographs, diagrams.

766* Precautions in Handling and Storing Hazardous Liquids and Materials. *Plant*, v. 8, Sept. 1953, p. 52-54.

Outlines precautionary measures in lift truck and manual handling operations. Suggests recommended practices for storage areas. Photographs, tables.

767* Power Transmission. VI. Progress and Development of Mechanical Power (1918-1933). William Staniar. *Plant*, v. 8, Sept. 1953, p. 65-68.

Reviews hydraulic transmissions, including fluid drives and hydraulic couplings. Supplies information on currently available mechanisms for accomplishing stepless or infinite speed variations. Photographs, diagrams.

768* Designing Superpressure Feed Pumps. Hans Gartmann. *Power*, v. 97, Nov. 1953, p. 71-74.

Describes methods of feeding boilers that operate above critical pressures. Diagrams, photographs.

Miscellaneous Publications and Books

769* Rotary-Piston Pumps: How They Can Do a Job in Your Plant Today. *Power*, v. 97, Nov. 1953, p. 116-117, 224.

Discusses radical pistons, reverse pumping, pump construction, and self-unloading pumps. Diagrams, photographs.

770 Design of V-Belt Drives for Mass Produced Machines. William Spencer Worley. *Product Engineering*, v. 24, Sept. 1953, p. 154-160.

Describes how to calculate proper belt size and sheave diameters. Photographs, graphs, tables, diagrams.

771* Neutral Holes in Plane Sheet. Reinforced Holes Which Are Elastically Equivalent to the Uncut Sheet. E. H. Mansfield. *Quarterly Journal of Mechanics and Applied Mathematics*, v. 6, Sept. 1953, p. 370-378.

Gives mathematical formulas to determine shape of a neutral hole and the variation along the hole boundary of the cross-sectional area of the reinforcement. Diagrams.

772* Estimation of the Fatigue Life of a Transport Aircraft. P. B. Walker. *Royal Aeronautical Society, Journal*, v. 57, Oct. 1953, p. 613-617.

Presents simple formula for the above from standpoint of wing fatigue. Gusts are treated as main determining factor. 4 ref.

773* Shapes and Joints in Machine-Building. (German.) Karl Jurczyk. *Schwissen und Schneiden*, v. 5, no. 7, July 1953, p. 252-256.

Examines shapes and joints of plants and animals and applies principles to machine building. Welding techniques are employed. Photographs, diagrams. 10 ref.

774 Servo Design for Missile and Aircraft Flight Control. Robert J. Bibbero and Roland Grandgent. *Tele-Tech*, v. 12, Nov. 1953, p. 74-76, 151-154.

Delineates ideal design process. Diagrams, photographs.

775 Charts Relating the Compressive Buckling Stress of Longitudinally Supported Plates to the Effective Deflectional and Rotational Stiffness of the Supports. Roger A. Anderson and Joseph W. Semonian. *U. S. National Advisory Committee for Aeronautics, Technical Note* 2987, Aug. 1953, 53 p. (TL570 Un3t)

The stability of a plate under edge compressive stress was analyzed. Deflectional and rotational restraint provided by longitudinal stiffness and full-depth webs is discussed. Diagrams, graphs, tables. 11 ref.

776 Column Strength of H-Sections and Square Tubes in Postbuckling Range of Component Plates. P. P. Bijlaard and G. P. Fisher. *U. S. National Advisory Committee for Aeronautics, Technical Note* 2994, Aug. 1953, 106 p. (TL570 Un3t)

The column buckling stress in the range where component plates have buckled was calculated by method of split rigidities. Graphs, diagrams, photographs. 19 ref.

Books and Miscellaneous Publication

777 Automation. Challenge to Management. Boris Gardarsky, Norman M. Hinerfeld, Manfred D. Moross, Oliver Prescott, III, Samuel L. Rosenfeld, and William I. M. Turner, Jr. 89 p. 1953. Harvard Univ. Press. (QA75 G16a)

Contain chapters covering "The Development of Technology Toward Automation", "Why Automation?", "Survey of Contemporary Automaticity", "What Automation Means", "A Glimpse of the Future", "Preparing the Way for Automation", and "Social Effects of Automation".

778 Fundamental Theory of Servomechanisms. LeRoy A. MacColl. 130 p. 1945. D. Van Nostrand Co., New York. (TJ213 Mi3f)

Recent years have seen a tremendous advance in the automatic control art. The story of this advance is essentially the story of modern servomechanisms. Presents a comprehensive introduction to the fundamental theory of servomechanisms.

See also:
479 (industrial electronic controls)

26. METALLURGY

779* Processing of Tombac-Covered Iron-Plate Scrap by Electrolysis in Sodium Cyanide Solution. (Hungarian.) Tibor Nagy. *Aluminium (Budapest)*, v. 5, no. 6, June 1953, p. 134-143.

Describes process and equipment for removal of brass plate. Tables, graphs.

780* Fabrication of Copper and Copper Alloys. Some Common Faults. David D. Stead. *Australasion Engineer*, 1953, Aug. 7, p. 48-53.

Discusses manufacture of hot pressings, corrosion failures, fire cracking, annealing, embrittlement, welding, forming, drawing, machining, finishing, and design. Photographs, micrographs.

781 Copper, Lead and Zinc. Their Future. Webster Hodge. *Battelle Technical Review*, v. 2, Oct. 1953, p. 111-112.

Gives applications and sources of Cu, Pb, and Zn.

782* Aluminum Progress That Brings New Products. *Dun's Review and Modern Industry*, v. 62, Aug. 1953, p. 51-57.

Photographic review of this industry that now produces over 100,000 tons per month.

783 Experience With Aluminum Tubing for Instrument Air Connections. D. W. Humphrey. *Instrument Society of America, Proceedings*, v. 7, 1953, p. 73-75.

Reviews availability, installation practices, users, and cost of Al tubing for instrument air connections. Photographs.

784* Which New Material Shall I Use? A Summary of Recent Developments. I. Julius J. Harwood. *Machine and Tool Blue Book*, v. 49, Oct. 1953, p. 208-210, 212, 214-216, 218-220, 222, 224-232.

Discusses properties and possible uses of Ti, Al, steels, and reinforced plastics for rockets, missles, and atomic reactors. (To be continued.)

785 Wear Resistant Metal. E. L. Schaper. *Materials & Methods*, v. 38, Oct. 1953, p. 120-123.

Describes successful use of Mg alloys in bearings, shafts, and gears. Photographs, tables.

786* Aluminum Sheet Metal Practice in the Building Industry. *Modern Metals*, v. 9, Oct. 1953, p. 62, 64, 66, 68.

Deals with cornices, gutters, downspouts, ductwork, flues and chimneys. Photographs, tables, diagrams.

787 When Can You Use Cast Iron in the Refinery? W. J. Buxton. *Oil and Gas Journal*, v. 52, Oct. 19, 1953, p. 128-130, 132.

Describes uses and limitations of cast iron in petroleum refining equipment. Photographs.

788* Frames of Prestressed Steel. (French.) G. Magnel. *Ossature metallique*, v. 18, no. 10, Oct. 1953, p. 507-519.

Describes calculations and applications in a hangar at Melbroeck, Belgium. Diagrams, photographs.

789 Titanium Metallurgy. Hugh E. Voress, complier. *U. S. Atomic Energy Commission*, TID-3039, Apr. 14, 1953, 57 p. (UF767 Un3ti)

A bibliography of unclassified report literature containing 366 references. Includes author, subject, and numerical indexes.

790 The Use of Multilayer High Reflecting Films for Reflection Multiple-Beam Interferometry. S. Tolansky. *Vacuum*, v. 2, July 1952, p. 231-244.

Includes photographs. 9 ref.

791 A Nickel-Free Austenitic Steel for High-Strength Wire. H. O. McIntire and G. K. Manning. *Wire and Wire Products*, v. 28, Oct. 1953, p. 1019, 1022-1026.

Discusses development of an alloy low in scarce elements and suitable for drawing into nonmagnetic wire. Tables, graphs, photographs.

792 Metallurgical Dictionary. J. G. Henderson and J. M. Bates. 396 p. 1953. Reinhold Publishing Corp., New York, N. Y. (PE1683 H38m)

Includes over 5,000 informative definitions and descriptions covering all the most essential terms in both production and physical metallurgy. Presents a convenient source of information for scientiests, engineers, technicians, specification writers, purchasing agents, architects, and builders.

793 Utilization of Manganese, Nickel, Cobalt, Tungsten, Molybdenum. Kenneth H. J. Clark, chairman. 94 p. 1951. In-

26. *Metallurgy*

ternational Materials Conference, Washington, D. C. (Ta459 In 8u)

Examines all practicable measures of effecting the highest degree of economy in the use of Mn, Ni, Co, W, and Mo. Includes methods which could be adopted by industry for the economical and efficient utilization of these metals and their alloys. Use of substitutes and waste products are given special consideration.

794 Modern Uses of Nonferrous Metals. C. H. Mathewson, editor. 2nd Ed. 530 p. 1953. American Institute of Mining and Metallurgical Engineers, New York. (TA459 M42m2)

Presents properties and behaviour of metals commonly used as alloys.

See also:
350 (applications of high-Cr alloys)

27. METALS—EXTRACTION AND REFINING

795* General Principles Used in Pyrometallurgical Processes of Tin Refining. (Portuguese.) Tharcisio D. de Souza Santos. *ABM (Boletim de associacao brasileira de metals)*, v. 9, no. 31, Apr. 1953, p. 199-218.

Discusses the separation of the aggregae phase, liquidus-solidus separation, and refining processes based on differences in temperature, pressure, and concentration. 16 ref.

796* Practical Aspects of the Parkes Process for Separating Silver From Lead in the Refining Installation of the Institute of Technical Research. (Portuguese.) Tharcisio D. de Souza Santos. *ABM (Boltin da associacao brasileira de metals)*, v. 9, no. 31, Apr. 1953, p. 219-234.

Describes the three phases in which the above work is done. Equipment and technique are discussed. Tables, graphs. 7 ref.

797* Contributions to the Classical Theory of Jigging. (English.) G. Tarjan. *Acta Technica Academiae Scientiarum Hungaricae*, v. 6, nos. 1-2, 1953, p. 79-121.

Discusses the motion of a solid body in a pulsating up-and-down current. Tables, graphs, diagrams.

798 Heavy-Media Separation Processes for Mineral Concentration. *American Cyanimid Company, Mineral Dressing Notes*, no. 19, May 1953, 32 p. (TN500 A35o)

Desecribes representative plants for iron, lead, zinc, lead-zinc, fluorspar, tin, diamondiferous, chrome, and manganese ores; and for magnesite, dolomite, andalusite, gravel, brucite, and coal. Photographs, diagrams. 82 ref.

799 Porosity and Adsorptivity in Iron Ores from New Quebec Compared With Standard Ores. Jean Laneuville. *Canadian Dept. of Mines, Province of Quebec, Laborartories Branch, P. R. no.* 277, 1953, 18 p. (TN7 C16.5p)

Research was carried out on 8 samples. The volumes of Hg, H_2O, H_2, air, and CO_2 penetrating the pores of each ore were measured. Tables, diagram, graphs.

800* Studies in the Carbonate Leaching of Uranium Ores. I. Description of the Pressure Leach Process and Its Application to Pitchblende Ores. F. A. Forward and J. Halpern. **II. Kinetics of the Dissolution of Pitchblendes.** F. Peters and J. Halpern. **III. Precipitation of Uranium from Carbonate Solutions by Reduction with Hydrogen.** F. A. Forward and J. Helpern. *Canadian Mining and Metallurgical Bulletin*, v. 46, no. 498, Oct. 1953, p. 634-648; *Canadian Institute of Mining and Metallurgy, Transactions*, v. 56, 1953, p. 344-358.

Tables, graphs. 19 ref.

801* Improving of Basic Bessemer Steel. Utilization of Oxygen. (French.) M. Allard. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, 1953, no. 10, p. 1585-1589.

Discusses possibilities and problems of changes effected in the charge, desulfurization, normalizing the nitrogen content, and decreasing phosphorus content.

802 FluoSolids Roasting of Zinc Concentrates for Contact Acid. T. T. Anderson and R. Bolduc. *Chemical Engineering Progress*, v. 49, Oct. 1953, p. 527-532.

Describes design problems and development of the first commercial plant in North America for the above process. Diagrams, graph, table.

803* Inductively Heated Melting and Holding Furnaces. (German.) E. Bertram. *Giesserei*, v. 40, no. 20, Oct. 1953, p. 527-533.

Discusses advantages, designs, data on energy consumption, and effect of operating time on energy consumption. Describes principles of crucible furnaces and possible application of low-frequency furnaces. Diagrams, tables, graphs. 3 ref.

804 The Production and Properties of Tantalum and Zirconium. G. L. Miller. *Industrial Chemist and Chemical Manufacturer*, v. 29, Oct. 1953, p. 482-488.

Describes production of Ta and Zr and discusses their application in the chemical industry with reference to corrosion resistance and mechanical properties.

805 New Skinningrove Blast-Furnace. H. G. W. Debenham and W. H. Tubbs. *Iron & Steel*, v. 26, Oct. 1953, p. 460-467.

Describes equipment, plant layout, and operating procedures. Diagrams, photographs. (To be continued.)

806 Some Factors Affecting Productivity in a Cold-Metal Open-Hearth Shop. W. S. Walker. *Iron and Steel Institute, Special Report no.* 48, Jan. 1953, p. 17-23.

Discusses effect on productivity of the 5 constituent parts of the production cycle and the factors that influence them. Gives results of tests. Graphs, diagrams, photographs. 3 ref.

807 Blast-Furnace Practice at Redcar Works. A. T. Ledgard. *Iron and Steel Institute, Special Report no.* 48, Jan. 1953, p. 24-36.

Paper covers operation of 2 blast-furnaces of identical design.

808* On the Possibility of Removing Copper from Steel and Pig Iron. (Swedish.) Louis Améen and Claes Pfeiffer. *Jernkontorets Annaler*, v. 137, no. 7, 1953, p. 238-251.

Discusses uses of Pb, Ag, and Bi for washing Cu at 1600 C. Tables, graphs.

809* Decreasing the Coke Needs in Pig Iron Production. (Hungarian.) Laszlo Visnyovszky. *Kohaszáti Lapok*, v. 8, no. 5, May 1953, p. 97-107; no. 6, June 1953, p. 121-126.

Proposes various methods on the basis of Hungarian industrial experience. Discusses additions of quick-lime and dolomite. Describes protection against heat losses and control of the amount of slag. Tables, graphs. 11 ref.

810 Magnesium Production. *Metal Industry*, v. 83, Oct. 9, 1953, p. 295-298.

Describes equipment, plant layout, and procedures of only Mg works in United Kingdom. Photographs.

811* The Coreless Induction Furnace. (German.) W. Scheibe. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 698-700.

Discusses economic aspects and uses. Theoretical fundamentals are discussed. Diagrams, photograph. 11 ref.

812* Several Problems in High-Vacuum Metallurgy. (German.) W. Scheibe. *Metall*, v. 7, nos. 19-20, Oct. 1953, p. 751-754.

Discusses annealing, melting, sintering, distilling, and sublimating methods of purifying metals. Special attention is paid to melting of Ti by electric arc and suspension methods. Graphs, photographs, diagrams.

813* The Conditions for a Favorable Distribution of Materials in the Blast Furnace. (French.) Jean Vibrac. *Métallurgie et la construction mécanique*, v. 85, no. 9, Sept. 1953, p. 685-693.

Outlines importance of correct distribution of charge and factors determining it. Calculations are given. Diagrams, graphs, table. (To be continued.)

814 Some Aspects of Vacuum-Melted Metal. J. H. Moore. *Metal Progress*, v. 64, Oct. 1953, p. 103, 105.

Discusses advantages of refining metal under reduced atmospheric pressure. Graphs.

815* Power and Stability of Flotation Frothers. Governing Factors. S. A. Wrobel. *Mine & Quarry Engineering*, v. 19, Oct. 1953, p. 363-367.

Discusses factors relating to froth stability and power. Offers hypotheses for phenomena of froth formation. Diagrams.

816* Accessories in Nickel Converter Practice. C. C. Downie. *Mining Journal*, v. 241, Sept. 25, 1953, p. 360-361.

Discusses some improvements now in established practice and others requiring further research.

817* The Sydvaranger Story. *Mining World*, v. 15, Oct. 1953, p. 49-72, 74-76.

Consists of a group or articles covering the history of taconite operations in Norway, geology of the area, ore removal and processing, mill equipment, and power generation.

818* Production of Lead-Calcium Alloys. (Polish.) Z. Máslanka-Ormanowa. *Prace Instytutow Hutnictwa*, v. 5, no. 2, 1953, p. 89-104.

Discusses methods of production. Tables, graphs. 9 ref.

819* Systematic Study by Means of Yield Charts of the Factors Determining the "Blowability" of Charges in the Basic Bessemer Converter. (French.) P. Leroy, M. Gombert, and B. Trentini. *Revue de Métallurgie*, v. 50, no. 9, Sept. 1953, p. 642-664.

The effect of the total area of blowing orifices was determined during a progressive decrease in the number of orifices, comparisons were based on the quality of the heat and the permeability of the charge. Tables.

820* Some Recent Progress in Ore Concentration and the Production of Non-Ferrous Metals. (French.) Maurice Ray. *Revue universelle des mines*, v. 9, ser. 9, no. 7, July 1953, p. 417-424.

53 ref.

821* The Low Shaft Furnace Industry. (German.) Heinz Schumacher. *Revue universelle des mines*, v. 9, ser. 9, no. 8, Aug. 1953, p. 493-504; disc., 504-511.

Discusses advantages of using increased amounts of O_2 in steelmaking. Tables, graphs, diagrams.

822* Hydrodynamic Study of Liquid Movements in the Basic Bessemer Converter. (German.) P. Leroy. *Revue universelle des mines*, v. 9, ser. 9, no. 8, Aug. 1953, p. 512-539; disc., p. 539-546.

Discusses geometrical and physico-chemical factors influencing action of blast on melt. Diagrams, graphs. 13 ref.

823* Killed Basic Bessemer Steels. (French.) Marc Allard. *Revue universelle des mines*, v. 9, ser. 9, no. 8, Aug. 1953, p. 563-568; disc., p. 568-570.

Discusses possibilities of obtaining steels by the Bessemer process which are superior to ordinary open-hearth steels. Tables.

824* Report on the Production of Improved Converter Steel in the Low-Shaft Converter. (German.) K. E. Mayer and H. Knuppel. *Revue universelle des mines*, v. 9, ser. 9, no. 8, Aug. 1953, p. 571-597.

Discusses influence of N, O, P, and C on ductility and tendency to brittleness of steel. Graphs, tables, diagram. 47 ref.

825* Nodulizing Iron Ores & Concentrates at Extaca Plant. R. L. Mennett, R. E. Hagen, and M. V. Mielke. *Skillings Mining Review*, v. 42, Oct. 17, 1953, p. 1-2, 4, 21, 23.

Discusses the nodulizing process. Describes experimental kiln installations. Photographs.

826* Bath Currents in the Converter and Nitrogen Content of Steel. (German.) Karl Daeves. *Stahl und Eisen*, v. 73, no. 20, Sept. 1953, p. 1280-1282.

Discusses effects of converter design and low bath levels on reduced N content. Graphs, diagrams, photographs. 6 ref.

827* Contribution to the Improvement of the Life of Basic Converters and Bottoms. (German.) David Bird. *Stahl und Eisen*, v. 73, no. 21, Oct. 1953, p. 1337-1338.

Improvement of converter life and quality of steel is obtained by use of "3-4-1" dolomite lining. Tables, diagrams. 5 ref.

828* Investigation of the Tar for Converter Floors. (German.) Raimond Calaque. *Stahl und Eisen*, v. 73, no. 21, Oct. 1953, p. 1339.

Shows that the life of the converter is greatly influenced by tar as a binder. Table.

829 Metallurgical Investigations of Southeastern Missouri Cobalt-Nickel Resources. H. Kenworthy and K. K. Kershner. *U. S. Bureau of Mines, Report of Investigations* 4999, Sept. 1953, 37 p. (TN21 Un3r)

Sulfide-ore concnetrates were treated successfully on a laboratory scale to recover more than 90% of the Co, Ni, and Cu. Commercial treatment netted a recovery of over 75% of the Co and about 90% of the Ni and Cu in the form of a Pb-Zn fume, a CuS concentrate, and a Co-Ni-Fe product. Tables, micrographs, diagrams. 44 ref.

830* Slagging of Cobalt from Cobalt-Containing Copper Melts. (German.) Friedrich Johannsen and Klaus Emicke. *Zietschrift für Erzbergbau und Metallhüttenwesen*, v. 6, no. 9, Sept. 1953, p. 341-348.

Discusses concentrating Co in slag by slightly oxidizing the melt. Tables, graphs. 10 ref.

831* Melting Metals Without Contamination by Crucible Reaction. (German.) Otto Winkler. *Zeitschrift für Metallkunde*, v. 44, no. 8, Aug. 1953, p. 333-341.

Discusses arc-melting and melting by induction using electromagnetic suspension or drip melting from a bar. Diagrams, photographs. 21 ref.

Books and Miscellaneous Publications

832 The All-Basic Open-Hearth Furnace. BISRA Special Report no. 46. 92 p. 1952. Iron and Steel Institute, London, S. W. I. (TN601 16s)

Papers included are Part I. "History of the All-Basic Open-Hearth Furnace", W. A. Archibald; Part II. "Properties of Basic Raw Materials and Bricks", G. R. Rigby; Part III. "The Trial All-Basic Furnaces in Great Britain and Holland", D. C. Muir; Part IV. "Stresses in All-Basic Furnace Roofs": "Calculated Roof Stresses", J. E. Pluck; "Calculated Roof Stresses in an All-Basic Furnace at Bilston, 1938", J. McCracken and L. G. Stokes; Part V. "Operating Experience on the Trial Furnaces", J. McCracken; Part VI. "Performance of Refractories in All-Basic Open-Hearth Furnaces", J. Mackenzie; and Part VII. "A Critical Analysis of the Results of All-Basic Open-Hearth Furnace Trials", J. H. Chesters and J. Mackenzie.

See also:
902 (production of metals and alloys)

28. METALS—FINISHING, POLISHING, AND CLEANING

833 Fast Polishing Method Brings Out Graphite. R. W. Lindsay and J. M. Snook. *American Foundryman*, v. 24, Nov. 1953, p. 48-50.

Describes cutting specimen, grinding, first and second wet polishing operations, and preparation of the chromic oxide abrasive. Micrographs.

834* A Dynamic Test for Detergency of Hard Surfaces. Manuel N. Fineman. *ASTM Bulletin*, 1953, no. 192, p. 49-55.

Describes test method to determine efficiency of detergents in cleaning wide variety of surfaces. Graphs, tables. 11 ref.

835* Mutual Polishing of Various Crystals. (Russian.) V. D. Kuznetsov. *Doklady Akademii Nauk SSSR*, v. 89, no. 2, Mar. 11, 1953, p. 271-274.

Considers the above method to be more advantageous than that of regular grinding. Process is easily mechanized. Diagrams.

28. *Metals—Finishing, Polishing, and Cleaning*

836 Abrasive Shot Cuts Sheet, Strip Cleaning Costs. Gilbert D. Dill. *Iron Age*, v. 172, Oct. 29, 1953, p. 91-93.

Describes equipment, technique, and advantages over pickling process.

837 How to Descale Titanium. A. E. Durkin. *Materials & Methods*, v. 38, Oct. 1953, p. 107-109.

Describes molten caustic baths as most practical method. Tables, graphs. 6 ref.

838* Sequestering Agents in Aluminum Etching. Francis J. Prescott, John K. Shaw, and Jay Lilker. *Metal Finishing*, v. 51, Oct. 1953, p. 65-67.

Use of gluconic acid resulted in a decrease in amount and adherence of scale. Photographs, table. 12 ref.

839 Recommended Techniques for Polishing Titanium for Metallographic Examination. Roman Osadchuk, William P. Koster, and John F. Kahles. *Metal Progress*, v. 64, Oct. 1953, p. 129-131, 236, 240.

Describes mechanical and electrolytic techniques.

840* Time Charts for Tumbling and Degreasing Mild Steel Parts. *Metal-Working*, v. 9, Oct. 1953, p. 26-27.

Discusses tumbling and vapor degreasing. Graphs.

841* Practical and Comparative Study of Several Processes in the Preparation of the Casting Before Coating by Electrolysis or by Immersion in Molten Metals. (French.) G. Lerouge. *Metaux, Corrosion-Industries*, v. 28, nos. 335-336, July-Aug. 1953, p. 302-318.

Discusses attempts to eliminate foundry "skin" and graphite carbon. Deposits effected on differently prepared metals were studied. Tables, micrographs, diagrams. (To be continued.)

842* Cleaning Stainless Steel Work. II. E. M. Rains. *Sheet Metal Worker*, v. 44, Sept. 1953, p. 80-81, 141.

Describes cleaning of outdoor installations, place of chemical cleaners in difficult jobs, how to remove hard water-detergent film, eliminating stencils and grease pencil marks, and methods for cleaning industrial equipment. Photographs. (Concluded.)

843 Coils Spin Through Rotary Pickler. *Steel*, v. 133, Sept. 28, 1953, p. 92, 94.

Describes principle and operation of high speed pickler for cleaning and oiling. Diagrams, photographs.

844* Finishes for Metals. I. Cleaning and Surface Preparation. Robert A. Wason. *Tool Engineer*, v. 31, Nov. 1953, p. 69-78.

Discusses necessity of adequate preparation of metal for finishing and gives methods of mechanical, temperature, and chemical cleaning. Photographs. (To be continued.)

845* Removal of Scale With Sodium Hydride. (Russian.) A. V. Smirnov, S. A. Semenkovich, and F. A. Bogachev. *Vestnik Mashinostroeniia*, v. 33, no. 3, March 1953, p. 37-39.

Describes process reducing metal losses for any composition and structure of scale. Diagram, table.

See also:
558 (economy in metal finishing)
1067 (damage by polishing materials)

29. METALS—FOUNDRY PRACTICE

846* An Interesting Medium-Frequency Furnace for Melting Aluminium. (German.) K. H. Brokmeier. *Aluminium*, v. 29, no. 10, Oct. 1953, p. 417-423.

Discusses design and results obtained. Diagrams, graphs, photographs.

847 Relation of Riser Range and Feeder Adequacy. I. William S. Pellini. *American Foundryman*, v. 24, no. 1953, p. 58-66.

Summarizes results of studies related to solidification of castings and to riser action. Diagrams, photographs, graphs, table. (To be concluded.)

848 Report of Committee A-3 on Cast Iron. J. S. Vanick, chairman. *American Society for Testing Materials, Preprint no.* 2, 1953, 6 p. (TA401 Am35p)

Presents proposed tentative methods of chill testing cast iron. Diagrams, tables.

849* An Analytical Study of the Die-Casting Process. Bruno Sachs. *ASTM Bulletin*, 1953, no. 192, p. 27-37.

Abridged from doctors dissertation. Discusses quality requirements, types of machines, and die-casting operations. Tables, diagrams, graphs. 20 ref.

850* The Die Casting Industry and Zinc. J. P. de Wet. *Canadian Mining Journal*, v. 74, Oct. 1953, p. 67-70.

Discusses history, present techniques, choice of alloy, terminology, contributions to industrial progress, and suitability of zinc. Photographs.

851* Foundry Practice. V. Moulding and Coremaking. William H. Salmon and Eric N. Simons. *Edgar Allen News*, v. 32, Oct. 1953, p. 231-232.

Concludes discussion of skeleton patterns and strickles and sweeps. Takes up machine molding. Diagrams. (To be continued.)

852* Use of Scrap Iron in the Cupola Furnace. (French.) Charles Dennery. *Fonderie*, 1953, Aug., no. 91, p. 3539-3555.

Discusses thermal, physico-chemical, metallurgical, and pure foundry aspects. Diagrams, graphs, photographs. 12 ref.

853 Drops Cupola Bottom Once a Week. Edwin Bremer. *Foundry*, v. 81, Sept. 1953, p. 124-125, 298, 300-301.

Describes practice in small foundry and outlines advantages that have resulted. Diagrams.

854 What is a Good Pattern? Walter Siebert. *Foundry*, v. 81, Sept. 1953, p. 132-133.

Shows that construction of a large, complex pattern requires patternmaking skill and designer's co-operation. Photographs.

855 Coke Quality and Carbon Pickup. C. R. Austin. *Foundry*, v. 81, Oct. 1953, p. 116-121, 234.

Describes tests intended to evaluate behavior of coke in the cupola, particularly with regard to its carburization power. Graphs, tables, micrographs, photographs.

856 Determination of Feeding Systems. Robert A. Cech. *Foundry*, v. 81, Oct. 1953, p. 128-131.

Describes method employed to determine feeder requirements of steel castings which has proved successful in improving soundness and yields. Diagrams, graphs. 7 ref.

857 Shell Molding. What Does It Cost? Walter W. Coleman. *Foundry*, v. 81, Oct. 1953, p .156, 158, 190-192.

Gives typical layout and production and cost data for shell mold foundry requiring 6 to 8 men. Diagram, table, photographs.

858 Graphite Spherulite Formation and Growth. Albert De Sy. *Foundry*, v. 81, Nov. 1953, p. 100-103, 210, 212, 218, 220.

Presents tentative complete theory and experimental results which give accurate details on mechanism of the above. Photographs. 10 ref.

859 Back-up Material for Shell Molds. William O. Faxon. *Foundry*, v. 81, Nov. 1953, p. 178, 180, 183-184.

Discusses considerations in choice of the above. Photograph, diagrams, graph.

860 Metal Melting Under Vacuum. *Foundry Trade Journal*, v. 95, Sept. 17, 1953, p. 365-367.

Discusses mechanical problems associated with process and present available solutions. Photographs, diagrams, graphs.

861 Effect of Pouring Conditions on Shrinkage Unsoundness in Bronze Ingots Cast in Metal, Carbon or Sand Moulds. W. T. Pell-Walpole. *Foundry Trade Journal*, v. 95, Sept. 24, 1953, p. 381-388; disc., p. 388-389.

Gives details of work to determine effect of rate and temperature of pouring on bronze cast in molds of widely-differing thermal characteristics. Graphs, tables. 11 ref.

862 Cast Iron for Enamelling. *Foundry Trade Journal*, v. 95, Oct. 1, 1953, p. 433-434.

Describes precautions in production of cast iron for enameling.

863 Feeding of Steel Castings at Greater-Than-Atmospheric Pressures. Charles W. Briggs and Howard F. Taylor. *Foundry Trade Journal*, v. 95, Oct. 8, 1953, p. 447-454.

Reports no dependable improvement in efficiency from using increased pressures except in isolated cases where low positive pressures were found more beneficial than high. Diagrams, photographs. 9 ref.

864 Effect of Stripping Time on the Structure of Chill-Cast Irons. G. J. Shaw and V. Kondic. *Foundry Trade Journal*, v. 95, Oct. 15, 1953, p. 473-478.

Experiments showed that the shorter the time casting is in mold, the greater the likelihood of obtaining carbon in graphitic form throughout cross-section of casting. Tables, photographs, diagrams, graph. 6 ref.

865 Making Castings by Shell Mold and Investment Processes. Robert R. Dohrmann. *General Motors Engineering Journal*, v. 1, Sept.-Oct. 1953, p. 8-11.

Describes processes and gives advantages of each. Photographs.

866 Use of Foam Plaster Process for Making Aluminum Alloy Torque Converter Castings. Kenneth B. Bly. *General Motors Engineering Journal*, v. 1, Sept.-Oct. 1953, p. 13-15.

Describes process providing wider range of core permeability by altering foam volume. Micrographs, photographs. 4 ref.

867 Revisions of German Industrial Standard DIN 52401: "Testing of Foundry Sand." (German.) H. Jungbluth. *Giesserei*, v. 40, no. 17, Aug. 20, 1953, p. 421-427.

Revised standard conforms closely with American standard. Graphs, tables.

868* Sand Testing by Swedish, German, and American Standards. (German.) E. O. Lissell and O. Carlsson. *Giesserei*, v. 40, no. 18, Sept. 1953, 445-454.

Discusses tensile-strength and permeability tests on samples from the 3 countries. Tables, graphs, diagrams. 11 ref.

869* Formation of Shrink Holes in Gray Cast Iron. (German.) L. Hunter. *Giesserei*, v. 40, no. 18, Sept. 1953, p. 455-457.

Hole formation depended on amount of eutectically separated graphite. Discusses influence of silicon. Graphs, diagram. 8 ref.

870* Production of Thin Walled Gray Cast Cylinders. (German.) August Winter. *Giesserei*, v. 40, no. 18, Sept. 1953, p. 460-462.

Recommends special attention to mixing of forming sand, charging, and manner of gating. Diagrams.

871* Cylindrical Test Block for Determining the Properties of Compressed Molding Sand. (German.) W. Götz. *Giesserei*, v. 40, no. 19, Sept. 1953, p. 469-477.

Describes test methods for determining strength and permeability. Photographs, tables, graphs. 12 ref.

872* High-Test Cast Iron, Especially Cast Iron with Compact to Spherical Graphite Structure. (German.) E. Piwowarsky. *Giesserei*, v. 40, no. 19, Sept. 1953, p. 477-482.

Discusses production of high-test ductile cast iron without the use of Mg or Ce. Graph, micrographs. 17 ref.

873* Molds for Cast Iron Worm Shafts and Conveyor Screws. (German.) *Giesserei*, v. 40, no. 19, Sept. 1953, p. 486-488.

Discusses production of patterns and molds. Diagrams.

874* Experiments with Hematite Pig Iron in Gray and Malleable Iron Foundries. (German.) C. W. Pfannenschmidt. *Giesserei*, v. 40, no. 20, Oct. 1953, p. 505-510.

Discusses behavior of gases in cast iron. Tables, photographs. 19 ref.

875* Oxygen and Nitrogen Contents of Hematite Pig Iron and the Finished Casting After Remelting in Different Furnaces. (German.) J. Willems, R. Opitz, M. Paschke, and C. W. Pfannenschmidt. *Giesserei*, v. 40, no. 20, Oct. 1953, p. 510-516.

Shows that melting reduces O_2 content and increases the N_2 content. Discusses effects of different furnace types. Stresses importance of good melting practices. Tables, graphs, photographs. 23 ref.

876* Effect of the Composition of the Charge on Malleable Iron From the Cupola Furnace. (German.) H. Siegel. *Giesserei*, v. 40, no. 20, Oct. 1953, p. 516-527.

Discusses causes of defective castings. Photographs, tables, diagrams, graphs.

877* Some Experiences in Systematizing Molding of Large Castings. (Swedish.) Gunnar Aberg. *Gjuteriet*, v. 43, no. 8, Aug. 1953, p. 137-142.

Discusses advantages of molding with cores and in cement sand. Describes various methods. Photographs.

878 Survey of the Shell-Moulding Method of Casting Production. Bernard N. Ames. *Institute of British Foundrymen, Paper no.* 1058, 1953, 24 p. (TS200 In7p)

Data includes mechanics of the process, metallurgical evaluations, machanization, plant safety, dimensional tolerance, gating and heading, applications, and economics. Photographs, graphs. 26 ref.

879 Pelleted Foundry Pitch. E. Brett Davies, T. F. N. Matthews, and G. Smart. *Institute of British Foundrymen, Paper no.* 1060, 1953, 5 p. (TS200 In7p)

Discusses use of pulverized coal-tar pitch as an additive to foundry sand. Photographs, graphs, tables.

880 Effects of Mould Resistance on Internal Stress in Sand Castings. R. N. Parkins and A. Cowan. *Institute of British Foundrymen, Paper no.* 1062, 7 p. (TS200 In7p)

Describes measurements made on castings to determine whether surrounding mold material offers restraint to the contraction of the casting as it cools. Discusses relation of restraint to high temperature strength of the sand. Diagrams, tables. 5 ref.

881 Inter-Relation of Combustion and Metallurgical Reactions in the Cupola. D. Fleming. *Institute of British Foundrymen, Paper no.* 1065, 1953, 13 p. (TS200 In7p)

Reviews experimental work. Diagrams, graphs. 13 ref.

882 "Foundry" Development in the Textile Industry. B. Gale. *Instiute of British Foundrymen, Paper no.* 1066, 1953, 15 p. (TS200 In7p)

Deals with the foundry production of castings for the machinery employed to manufacture yarns. Discusses types of machines, methods of production, and metallurgical aspects. Photographs.

883 Difficulties in the Production of Centrifugally-Cast Nickel-Bronze Bearing Shells. J. Taylor, Z. Stokowiec, and R. S. Jackson. *Institute of British Foundrymen, Paper no.* 1068, 1953, 9 p. (TS200 In7p)

Discusses mechanism of bubble formation, gas porosity, location of the defective metal, changes in solidification process, and Pb segregation. Tables, micrographs, diagrams.

884 Economic Utilization of Copper-Base Alloys. *Institute of British Foundrymen, Paper no.* 1069, 1953, 9 p. (TS200 In7p)

Discusses foundry and design factors. Tables. 6 ref.

885 Feeding of Steel Castings at Greater-Than-Atmospheric Pressures. Charles W. Briggs and Howard F. Taylor. *Institute of British Foundrymen, Paper no.* 1070, 1953, 18 p. (TS200 In7p)

Reviews principles established from previous work. Describes apparatus and applications. Results are analyzed and conclusions drawn. Diagrams, micrographs, tables. 17 ref.

886 Mould-Reaction in Aluminium-Alloy Castings. Marjorie Whitaker. *Institute of British Foundrymen Paper no.* 1072, 1953, 9 p. (TS200 In7p)

Describes investigation and discusses results. Micrographs, tables. 13 ref.

29. *Metals—Foundry Practice*

887 Organic Fillers Seal Defects in Metal Products. Helmut Thielsch. *Iron Age*, v. 172, Oct. 15, 1953, p. 118-121.

Discusses two groups organic fillers which permit salvaging rejected cast and welded parts. Tables, photographs.

888 Flow Properties of Foundry Sand. J. Gittus. *Iron & Steel*, v. 26, Oct. 1953, p. 475-478.

Discusses implications of bond energy ratio with regard to green strength, shatter, loose flow, and sieve tests. Graphs, photographs. 3 ref.

889 Lost-Wax Precision Casting. *Machinery (London)* v. 83, Oct. 2, 1953, p. 651-656.

Describes preparation of molds, casting, and sand reclamation plant. Photographs.

890 Coleman-Wallwork Shell Mould Making Machine. *Machinery (London)*, v. 83, Oct. 9, 1953, p. 722-724.

Describes design and use of above. Photographs. (To be continued.)

891* Tin Founding. W. D. Arnot. *Mechanical World and Engineering Record*, v. 133, Oct. 1953, p. 446-448.

Describes development of process for making small castings in pure metal. Photographs.

892 Continuous Casting of Copper Alloy Shapes. *Metal Industry*, v. 83, Sept. 18, 1953, p. 235-236.

Describes casting furnace and dies. Discusses structure and quality of the castings. Photographs, diagrams, table.

893 Die-Casting in the Lock Industry. *Metal Industry*, v. 83, Sept. 18, 1953, p. 237-241.

Portrays advantages of die cast parts over parts made by simple casting.

894 Metal Casting Methods. VI. Die Casting and Investment Casting. J. B. McIntyre. *Metallurgia*, v. 48, no. 287, Sept. 1953, p. 123-129.

Describes methods of production of shaped castings by reference to slush, press, pressure die, gravity die, and investment casting techniques. Photographs. 17 ref.

895* Cupola Furnace and Superheating of the Casting. (French.) J. Pascal. *Métallurgie et la construction méchanique*, v. 85, no. 7, July 1953, p. 607-609.

Discusses various types of furnaces and blasts. Diagrams, graphs. (To be continued.)

896* 1952 Hungarian Experiments on the Production of Nodular Chilled Iron Rolls. (Hungarian.) Bela Koros. *Ontöde*, v. 4, no. 5, May 1953, p. 97-103.

Reports on core strength and wear resistance tests following Mg additions. Tables, micrographs. 37 ref.

897* Melting Practice for Investment Casting. Sam Tour. *Precision Metal Molding*, v. 11, Oct. 1953, p. 64-65, 91-94.

Describes control of raw materials and design of melting equipment. Photographs.

898* The Technique of Melting and Casting Under High Vacuum. (German.) Otto Winkler. *Stahl und Eisen*, v. 75, no. 20, Sept. 24, 1953, p. 1261-1267; disc., p. 1267-1268.

Discusses design, operation, and casting procedure. Describes effect on chemical composition of the metal. Diagrams, graph, table. 5 ref.

899 Status Report on Continuous Casting. W. B. Pierce. *Steel*, v. 133, Oct. 12, 1953, p. 256-268, 260, 262, 265-266, 268-269, 271-272.

Describes process and equipment at one plant. Diagrams, photographs.

900* Sealing Castings for Air Tightness. Gilbert C. Close. *Western Machinery and Steel World*, v. 44, Oct. 1953, p. 98-100.

Describes how castings may be sealed in fabricating optical range finders. Photographs.

901* Thompson Products Adopts Low Cost, High Quality Shell Mold Casting Process. William Achor. *Western Metals*, v. 11, Oct. 1953, p. 72-74.

Describes equipment, plant layout, and procedures. Photographs.

Books and Miscellaneous Publication

902 Technology of Engineering Materials. B. Richard Hilton. 389 p. 1953. Butterworths Scientific Publications, London. (TN665 H56t)

Includes chapters on pattern making and patterns; molding and foundry practice; production of ferrous and non-ferrous metals and alloys; mechanical treatment of steels and non-ferrous metals and alloys; and heat treatment of ferrous and non-ferrous metals and alloys.

903 (Design of Pressure Cast Parts. Die and Pressure Casting.) **Gestaltung von Druckgussteilen, (Spritz- und Pressguss).** Gustav Lieby. 157 p. 1953. Franckh'sche Verlag-Shandlung, Stuttgart. (TS239 L62g)

Handbook on design of equipment, dies, molds, and parts. Discusses procedures for casting low- and high-melting, light and heavy metals.

See also:
109 (olivine foundry sand)
1084 (deoxidation of cast iron)
1193 (nondestructive testing of castings)

30 METALS—HEAT TREATMENT

904 Nitriding of Titanium With Ammonia. James L. Wyatt and Nicholas J. Grant. *American Society for Metals, Preprint no.* 3, 1953, 26 p. (TS300 Am35t)

A study of surface hardening techniques applicable to Ti was made to decrease wear and eliminate galling and seizing in commercial material and in Ti alloys. Diagram, graphs, micrographs. 7 ref.

905 Heat Treatment of High Strength, Titanium-Base Alloys. W. M. Parris, P. D. Frost, and J. H. Jackson. *American Society for Metals, Preprint no.* 4, 1953, 19 p. (TS300 Am35t)

The properties of heat treated Ti alloys were found to depend upon composition, type of heat treatment, and fabrication history. Table, graphs, micrographs. 9 ref.

906 Transformation Kinetics and Mechanical Properties of Titanium-Aluminum-Molybdenum Alloys. H. D. Kessler, and M. Hansen. *American Society for Metals, Preprint no.* 5, 1953, 22 p. (TS300 Am35t)

End-quench hardenability, time-temperature-transformation age hardening, and mechanical properties were studied. Tables, graphs, micrographs. 13 ref.

907 Transformation Kinetics and Mechanical Properties of Titanium-Aluminum-Chromium Alloys. H. D. Kessler and M. Hansen. *American Society for Metals, Preprint no.* 6, 1953, 28 p. (TS300 Am35t)

End-quench hardenability, time-temperature-transformation, age hardening, and mechanical properties were studied. Tables, graphs, micrographs. 5 ref.

908 Effect of Nonmartensite Decomposition Products on the Properties of Quenched and Tempered Steels. E. F. Bailey. *American Society for Metals, Preprint no.* 11, 1953, 18 p. (TS300 Am35t)

Times necessary for 10% and 30% decomposition to ferrite, pearlite, and bainite in AISI 1340 and 5140 were determined using Charpy bar-size specimens quenched into isothermal baths. Tables, graphs, micrographs. 8 ref.

909 Elevation of Critical Temperatures in Steel by High Heating Rates. W. J. Feuerstein and W. K. Smith. *American Society for Metals, Preprint no.* 19, 1953, 12 p. (TS300 Am35t)

The Ac and Ac_3 critical temperature were determined for AISI 1020, 1042, 1080, and 4130 steels in the annealed condition. Table, graphs, diagram. 6 ref.

910 Effect of Chemical Composition on Susceptibility of Steels to Temper Brittleness. Ralph Hultgren and John Chuan

Chang. *American Society for Metals, Preprint no.* 26, 1953, 14 p. (TS300 Am35t)

Studies were made on high purity alloys prepared by melting together the constituent elements under He. Tables, graphs. 9 ref.

911 The Embrittlement of Alloy Steel at High Strength Levels. L. J. Klingler, W. J. Barnett, R. P. Frohmberg, and A. R. Troiano. *American Society for Metals, Preprint no.* 27, 1953, 33 p. (TS300 Am35t)

Discusses 3 methods of minimizing embrittlement occuring during tempering of quenched steels. Tables, graphs. 41 ref.

912 Another Look at Quenchants, Cooling Rates and Hardenability. D. J. Carney. *American Society for Metals, Preprint no.* 5W, 1953, 43 p. (TS300 Am35t)

Discusses the above in quenched rounds and end-quench bars of low alloy steels. Tables, graphs, micrographs. 14 ref.

913 Thermal Reproducibility of the End-Quench Test. John Birtalan, R. G. Henley, Jr., and A. L. Christenson. *American Society for Metals, Preprint no.* 6W, 1953, 20 p. (TS300 Am35t)

Discusses water pressure and temperature, bar scale condition, and transfer time from furnace to quenching fixture. Graphs, photographs.

914 Analysis of Hardenability Under Marquenching Conditions. Carl M. Carman, Dominick F. Armiento, and Harold Markus. *American Society for Metals, Preprint no.* 7W, 1953, 21 p. (TS300 Am35t)

Discusses development of a Jominy-type hardenability test using molten salt at 400 F as quenching medium. Hardenability of 11 commercial heat-treatable steels was determined. Tables, graphs, micrographs, diagrams. 11 ref.

915 Precipitation Hardening in Austenitic Chromium-Nickel Steels Containing High Carbon and Phosphorus. A. G. Allten, J. G. Y. Chow, and A. Simon. *American Society for Metals, Preprint no.* 10W, 1953, 25 p. (TS300 Am35t)

A series of 21% Cr, 12% Ni steels containing 0.3 to 0.7% C and 0.03 to 0.5% P were studied by hardness, X-ray diffraction, electrical resistivity, and metallographic methods. Tables, graphs, micrographs. 18 ref.

916 Heat Treatment of Tool Steels. J. G. Ritchie. *Australasian Engineer,* 1953, Feb., p. 73-80; disc., p. 80-81.

Discusses metallurgical principles, water and oil hardening series, high speed-hot work series, annealing, and tempering. Tables, graphs. 4 ref.

917* Weldng of Chromium Steels. (Russian.) L. E. Fedotov. *Avtogennoe Delo,* v. 24, no. 6, June 1953, p. 21-21.

Discusses annealing of welded seams. 8 ref.

918* The Influence of Gaseous Atmosphere Containing Hydrogen on the Annealing of Malleable Cast Iron. S. W. Palmer. *British Cast Iron Research Association, Journal of Research and Development,* v. 5, Aug. 1953, p. 26-37.

Discusses influence of H_2 on rate of heating and graphitazation of blackheart malleable. Micrographs, graphs, tables.

919 Oxy-Acetylene Flame Hardening. *Canadian Metals,* v. 16, Oct. 1953, p. 40, 42, 44.

Discusses process which consists essentially of raising metal locally above its transition temperature and quenching rapidly. Photographs, diagram, graph.

920* Nitriding of Certain Nickel-Cobalt Alloys Near Their Curie Point. (French.) Georges Nury. *Comptes rendus,* v. 237, no. 13, Sept. 28, 1953 p. 654-656.

Experiments were made between 300 and 600 C, on alloys containing 8, 9, 10, and 12% Co. Harness-temperature curves were plotted. Graphs.

921 Second-Stage Malleablization. Floyd Brown. *Foundry,* v. 81, Oct. 1953, p. 108-109, 203, 205-207.

Considers direct and indirect transformation mechanism in determining most economical conditions for 2nd stage malleablization. Diagrams, tables. 3 ref.

922 Electric Annealing of White Iron. Richard W. Parsons. *Foundry,* v. 81, Nov. 1953, p. 112-115.

Describes improved annealing techniques for cast iron, resulting in superior mechanical properties. Graphs, photographs.

923 Heat Treatment of Steel Castings. II. John Howe Hall. *Foundry,* v. 81, Nov. 1953, p. 124-127, 242, 244, 246, 248.

Discusses effects of ferrite and pearlite on cast steels containing 0.18 to 0.20% C and effects of time-temperature relationships on structure and properties. Photographs, diagrams, graphs. 2 ref. (To be concluded.)

924 Heat-Treatment of Metal and Its Fire Hazards. R. W. Oxenbury. *Foundry Trade Journal,* v. 95, Sept. 24, 1953, p. 399-400.

Discusses fire and explosion hazards of quenching tanks, oil storage, and salt baths.

925 Low Temperature Stress Relieving of Mild Steel Welded Structures. L. E. Benson and S. J. Watson. *Institute of Welding, Transactions,* v. 16, Aug. 1953, p. 90-95.

Describes experiments designed so that a quantitative estimate could be made of efficiency of stress relieving treatments at temperatures below 600 C, and particularly in region of 200-300 C. Tables, graphs, photographs, diagrams. 4 ref.

926 Hot Face Insulation. *Iron & Steel,* v. 26, Oct. 1953, p. 468-470.

Discusses operating advantages of its use in large annealing furnaces. Tables, diagrams.

927 High Speed Continuous Annealing of Tinplate. M. D. Stone and E. A. Randich. *Iron and Steel Engineer,* v. 30, Oct. 1953, p. 69-75; disc., p. 75-78.

Discusses plant layout, equipment, and operating procedures. Diagram, photographs. 7 ref.

928* Cementite Formation in Mild Steel and Sponge Iron on Gas Carburizing. (Swedish.) T. Norén and U. Landergren. *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 209-216.

Discusses formation at temperatures below A_1. Table, graph. 20 ref.

929* Conditions for the Formation of Cementite During the Carburization of Nickel Steels. (Swedish.) A. Hultgren and M. Hillert. *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 217-223.

Discusses cementite formation decreasing with increased Ni content. Graph, micrograph. 4 ref.

930* Application of an Air Cooling Machine for Metal Tempering. (Russian.) L. Rozenfel'd and N. Koshkin. *Kholodil'naia Teknika,* 1953, no. 2, Apr.-June, p. 15-19.

Describes obtaining of temperatures down to −110 C. Table, graphs, photographs, diagram.

931 Stainless Steel Wire. J. Lomas. *Machinery Lloyd (Overseas Ed.),* v. 25, Sept. 26, 1953, p. 82-83.

Discusses softening treatment, high temperature annealing, and avoiding brittleness.

932 Surface Hardening of Steels and Irons. John L. Everhart. *Materials & Methods,* v. 38, Oct. 1953, p. 137-152.

Discusses carburizing; nitriding; cyaniding and carbonitriding; and flame and induction hardening. Photographs, tables.

933* Copper and Copper Alloys. XII. Chromium-Copper. (Dutch.) W. G. R. De Jager. *Metalen,* v. 8, no. 17, Sept. 15, 1953, p. 328-329.

Heat treatment, properties, and uses of Cr-Cu alloys are discussed. Graphs.

934 The Bright Annealing of Copper and Its Alloys. W. C. F. Hessenberg, and E. C. Mantle. *Metal Industry,* v. 83, Oct. 2, 1953, p. 279-281.

Discusses O_2-free atmospheres used in heat-treating Cu to reduce or eliminate oxide scaling. Diagrams, photographs. 6 ref. (To be continued.)

30. *Metals—Heat Treatment*

935 Flame Hardening Machines Speed Treatment of Engine Components. Arthur H. Allen. *Metal Progress*, v. 64, Oct. 1953, p. 97-102.

Reports that mechanization of flame hardening process has resulted in accurate control, efficiency, and ease of equipment maintenance. Photographs.

936* Prospects of Oxy-Acetylene Low-Temperature Stress Relieving of Welds of Boilers and Pressure Vessels. (German.) W. Mielentz. *Schweissen und Schneiden*, v. 5, no. 7, July 1953, p. 268-269.

Discusses 3 methods of treatment and evaluates them technologically, metallurgically, and economically. 7 ref.

937* Industrial Quenching of Basic Converter Steel From Rolling Heat. (German.) Franz Kösters. *Stahl und Eisen*, v. 73, no. 21, Oct. 1953, p. 1342-1348.

Describes design and operation of a device for hardening round and structural steel up to 12 meters long. Discusses effect on mechanical properties. Tables, diagrams, graphs.

938* Electric Hardening of Tool Bits. (Russian.) L. Ia. Popilov. *Stanki i Instrument*, v. 24, no. 5, May 1953, p. 17-19.

Describes apparatus and process. Presents results of processing C- and high speed-steel tools. Tables.

939 Batch Heat Treating Is Versatile. Frank Crahen. *Steel*, v. 133, Sept. 28, 1953, p. 86-87.

Discusses equipment and handling techniques. Photographs, table.

940 Surface Treatment of Titanium. *Steel*, v. 133, Nov. 2, 1953, p. 130-132.

Summary of symposium sponsored by Watertown Arsenal at Armour Research Foundation. Describes hard surfaces produced by nitriding carburizing, carbo-nitriding, and induction heating. Reports silicon coating affords protection against oxidation. Photographs, graphs, table, diagram.

941 The Problems of Furnace Control. II. Leo Walter. *Steel Processing*, v. 34, Oct. 1953, p. 521-525.

Describes automatic controls for heat-treating furnaces. Diagrams.

942* Phase Stresses Arising During Cementation of High-Carbon Steel. (Russian.) V. V. Abramov. *Vestnik Mashinostroeniia*, v. 33, no. 6, June 1953, p. 70-71.

Shows that carburizing does not lead to additional deformations. Diagrams, graphs.

See also:

902 (heat treatment of metals and alloys)
958 (heat treatment of Ti-Mo alloys)
1019 (stress-relief tests on steel)
1030 (heat-treatment effect on ductility of steel)
1081 (heat treatment of forging steels)
1109 (tempering Fe-C alloys)

31. METALS—MECHANICAL AND PHYSICAL PROPERTIES

943* Relationship Between the Brinell Hardness and the Microstructure of Ordinary Lamelar-Graphite Cast Iron. (Portuguese.) Werner Grundig. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 31, Apr. 1953, p. 169-188.

Discusses experimental investigation on 80 specimens. 23 ref.

944 The Effect of Temperature and Composition on the Deformation of Single Crystals of Iron. (English.) H. W. Paxton and A. T. Churchman. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 473-479.

Speciments with 0.003 and 0.005% carbon were tested from −180 to 213 C. Cleavage fracture, mechanical twinning, simple and repeated yielding, and smooth stress-strain curves were observed in 0.003% carbon iron. Repeated yielding was not observed in 0.005% carbon alloy. Graphs. 19 ref.

945 Le Chatelier's Principle and Stress-Induced Displacive Transformations. (English.) E. S. Machlin and S. Weinig. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 480-482.

Tests were made on a 9% Mo-Ti alloy. Transformation occurred along planes parallel to the planes of maximum shear stress. Graph, micrographs.

946 Internal Friction of Iron and Molybdenum at Low Temperatures. (English.) Lo-Ching Chang and M. Gensamer. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 483-486.

Peaks were found at 100 K in Fe and possibly at 300 K in Mo, corresponding to ductile-brittle transitions in slow tension tests. Graphs, diagrams. 4 ref.

947 Dimension and Orientation effects in the yielding of Carburized Iron Sheet Crystals. (English.) A. N. Holden and F. W. Kunz. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 495-502.

Good correlation was observed between yield behavior and crystal length in the direction of slip except when tensile axis was within 10° of a [111] direction. Micrographs, diagrams. 12 ref.

948 The Low Temperature of Specific Heat of Antimony. (English.) W. DeSorbo. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 503-507.

Measurements were made from 13 to 70 K. Data are compared to calculated values. Tables, graphs. 16 ref.

949 Work Hardening in Face-Centered Substitutional Alloys. (English.) J. S. Koehler. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 508-512.

Experimental data on mechanical properties of single crystals are reviewed. Source and impurity hardening are shown to be more important than interference hardening. Experiments are suggested. Graphs, micrographs. 17 ref.

950 The Splitting of Dislocations in Metals With Close-Packed Lattices. (German.) A. Seeger and G. Schöck. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 519-530.

Elastic properties of straight dislocation lines and splitting of half-dislocations in closest-packed lattice planes are discussed. Numerical results are given for Cu, Al and Co. Tables. 18 ref.

951 Criterion for the Action of Applied Stress in the Martensitic Transformation. (English.) J. R. Patel and M. Cohen. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 531-538.

Effects of stress on the transformation temperature were studied experimentally for iron-nickel and iron-nickel-carbon alloys under uniaxial tension, uniaxial compression, and hydrostatic pressure. Table, graphs. 13 ref.

952 Energy Absorption and X-Ray Studies of Kink Formation in Zinc Single Crystals. (English.) E. I. Salkovitz and J. S. Koehler. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 552-567.

Experiments revealed two consecutive stages are involved. A qualitative dislocation model is presented. Tables, graphs, photographs. 7 ref.

953 Study of the Origin of the Cube Texture. (English.) A. Merlini and P. A. Beck. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 598-606.

Cross-rolled copper did not develop cube texture on annealing. Results are in accordance with the oriented growth theory. Graphs, diagrams. 24 ref.

954 Relation Between Plastic Strain and Increase of Electrical Resistivity of Metals. (English.) H. G. van Bueren. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 607-609.

Experimental data indicate that vacancies and interstitial atoms are more effective than dislocations in causing increased resistivity of Cu, Ag, and Au. 6 ref.

955 Additional Notes on Textures in Extruded Aluminum. (English.) K. V. Gow. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 610.

Shows that coincidence lattice sites are important in determining orientation dependence of grain boundary migration rates. 3 ref.

956* Some Properties of Low Alloy High Tensile Steel Containing Molybdenum. J. Pow. *Alloy Metals Review*, v. 8, Sept. 1953, p. 2-7.

Discusses effect of a number of common alloying elements on Mn steel, stressing the advantages of Mo additions. Graphs, tables, photographs.

957* Some Hitherto Undiscussed Properties of the High-Strength Al-Mg-Si Alloy. (Hungarian.) Andor Benko. *Aluminium (Budapest)*, v. 5, no. 7, July 1953, p. 153-158.

Discusses modifications caused by impurities encountered during the manufacturing process. Describes softening conditions, corrosion resistance, deep drawing capacity, and adaptability to second rolling, fatigue limit, weldability, and the probability of hitting the correct composition during production. Tables, graphs.

958 Correlation Between Heat Treatment, Microstructure and Mechanical Propertes of Titanium-Molybdenum Alloys. D. J. DeLazaro and W. Rostoker. *American Society for Metals, Preprnt no.* 8, 1953, 18 p. (TS300 Am35t)

Tensile and impact properties were obtained for a wide range of time and temperature combinations of isothermal transformation. Tables, graphs, micrographs.

959 Transverse Mechanical Properties of Slack-Quenched and Tempered Wrought Steel. John Vajda and Paul E. Busby. *American Society for Metals, Preprint no.* 9, 1953, 25 p. (TS300 Am35t)

Presents a method for developing reproducible slack-quenched structures in heavy steel sections. Tables, graphs, micrographs. 12 ref.

960 The Effect of Inclusions on the Fatigue Strength of SAE 4340 Steels. J. T. Ransom. *American Society for Metals, Preprint no.* 12, 1953, 10 p. (TS300 Am35t)

Discusses nonmetallic inclusions as a source of fatigue weakness in forged machine elements. Tables, micrographs.

961 Observations on the Behavior of Hydrogen in Zirconium. C. M. Schwartz and M. W. Mallett. *American Society for Metals, Preprint no.* 14, 1953, 13 p. (TS300 Am35t)

Embrittling effects of H in Zr were studied. Tables, graphs, micrographs. 6 ref.

962 Recrystallization Applied to Control of the Mechanical Properties of Molybdenum. J. H. Bechtold. *American Society for Metals, Preprint no.* 15, 1953, 17 p. (TS300 Am35t)

Relates mechanical properties of Mo to microstructure developed by prior mechanical and thermal history. Tables, graphs, micrographs. 7 ref.

963 The Effect of Boron on Notch Toughness and Temper Embrittlement. A. E. Powers and R. G. Carlson. *American Society for Metals, Preprint no.* 21, 1953, 11 p. (TS300 Am35t)

Isothermal embrittlement curves were constructed for 2 Mn steels having identical base composition but differing in B content. Tables, graphs, micrographs. 6 ref.

964 Flow and Fracture of Single Crystals of High Purity Ferrite. R. P. Steijn and R. M. Brick. *American Society for Metals, Preprint no.* 36, 1953, 37 p. (TS300 Am35t)

Flow and fracture studies were made on single crystals of 2 high purity Ti ferrites and 1 high purity Fe-C alloy. Tables, graphs, diagrams. 16 ref.

965 Effects of Some Solid Solution Alloying Elements on the Creep Parameters of Nickel. Thomas H. Hazlett and Earl R. Parker. *American Society for Metals, Preprint no.* 38, 1953, 15 p. (TS300 Am35t)

Constant-stress creep studies were made on 4 series of solid solution Ni alloys. Graphs, tables. 6 ref.

966 Static and Fatigue Properties of Carbon, Silicon, and High-Strength Low-Alloy Steel Plates Having a Hole. Frank Baron and Edward W. Larson, Jr. *American Society for Testing Materials, Preprint no.* 73, 1953, 19 p. (TS401 Am35p)

Describes investigation to determine fatigue strengths, relationship between the fatigue strengths and the stress-strain characteristics, and relative advantages of the various steels for resisting fatigue loadings. Micrographs, graphs. 12 ref.

967 Effect of Grain Size and Carbon Content on the Low Temperature Tensile Properties of High Purity Fe-C Alloys. R. L. Smith, G. Spangler, and R. M. Brick. *American Society for Metals Preprint no.* 3W, 1953, 25 p. (TS300 Am35t)

Several low C ferrites were prepared and tested in tension under various conditions of heat treatment, ferrite grain size, and test temperature. Graphs, tables, micrographs. 30 ref.

968 The Substitution of Manganese for Nickel in 16-25-6 Alloys. Wells E. Ellis and Martin Fleischmann. *American Society for Metals, Preprint no.* 11W 1953, 15 p. (TS300 Am35t)

Discusses mechanical properties, precepitation hardening data, and microstructural characteristics of a modified Timken 16-25-6 alloy. Tables, graphs, micrographs.

969 Work Softening of 16-25-6 Alloy at Elevated Temperatures. Douglas A. J. Miller and John Wulff. *American Society for Metals, Preprint no.* 12W, 1953, 10 p. (TS300 Am35t)

True stress-true strain curves are presented for Timken alloy 16-25-6. Graphs, micrographs. 17 ref.

970 Effect of Grain Size on High Temperature Fatigue Properties. J. E. Breen and J. R. Lane. *American Society for Metals, Preprint no.* 13W, 16 p. (TS300 Am35t)

Tensile-fatigue and stress rupture tests were run on α-brass between 550 and 1000 F and at room temperature. Tables, graphs, micrographs. 8 ref.

971 Mechanical Anisotropy in Copper. W. A. Backfen, A. J. Shaler, and B. B. Hundy. *American Society for Metals, Preprint no.* 14W, 1953, 21 p. (TS300 Am35t)

A fibrous structure of flaws having charactreistics of cracks was found in speciments varying in purity and processing history. Tables, graphs, micrographs. 22 ref.

972 Effect of Prestrain Histories on the Creep and Tensile Properties of Aluminum. Oleg D. Sherby, Alfred Goldberg, and John E. Dorn. *American Society for Metals, Preprint no.* 15W, 1953, 20 p. (TS300 Am35t)

Data were correlated with various substructures developed during creep testing of annealed and cold worked pure Al. Tables, graphs, micrographs. 10 ref.

973 Effect of Dispersions of $CuAl_2$ on the Elevated Temperature Tensile Properties of AluminumI-Copper Allloys. C. D. Starr, R. B. Shaw, and J. E. Dorn. *American Society for Metals, Preprint no.* 16W, 1953, 13 p. (TS300 Am35t)

Tensile properties of 3, 4 and 5% Cu-Al alloys were investigated from 295 to 700 K. Tables, graphs, micrographs. 5 ref.

974* Thermal Effects of Metallurgical Reactions. (German.) Carl V. Schwarz. *Archiv fur das Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 285-306.

Presents heats of formation of 644 compounds encountered in metallurgical processes. Tables. 7 ref.

975* Behavior of Steels of Varying Notch-Impact Strength During Deformation by Multiaxial Loading. (German.) Richard Mailander, Hubert Bennek, and Eduard Houdremont. *Archiv fur das Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 315-321.

Discusses differences of steel in tendency toward brittle fracture. Photographs, graphs, tables. 7 ref.

976 The Effects of Cold-Drawing, Microstructure, and Thermal Treatments on the Machinability and Mechanical Properties of Carbon and Alloy Steel. Ford E. Dreves. *ASME, Transactions*, v. 75, Oct. 1953, p. 1219-1232.

Describes role of cold-finished steel mill in field of metal cutting. Photographs, tables, graphs, diagrams.

977 Survey of Investigations of Effects of Specimen Thickness on Rockwell Tests. R. H. Heyer and V. E. Lysaght. *ASTM Bulletin*, 1953, no. 193, p. 32-39.

Discusses important publications on subject and some unpublished work which merits attention of those concerned with hardness testing. Graphs, diagrams, table. 8 ref.

31. *Metals—Mechanical and Physical Properties*

978* Some Properties of Copper and Its Alloys Used in the Chemical Industries. David D. Stead. *Australasian Engineer,* 1953, Feb., p. 50-56.

Includes graphs, tables. 12 ref.

979* Aluminium and Alloys. Properties of Materials. F. R. Barnett. *Australasian Engineer,* 1953, Feb., p. 58-65.

Discusses mechanical, physical, and corrosion properties. Tables, photographs, graphs.

980* Impact Strength of Welded Joints of Railroad Cars of Open-Hearth and Bessemer Steel. (Russian.) S. V. Vershinski. *Avtogennoe Delo,* v. 25, no. 6, June 1953, p. 5-10.

Discusses brittle fracture of Bessemer steel and plastic deformation of open-hearth steel. Diagrams, tables, photographs.

981* The Fatigue Properties of Nodular Cast Iron. K. B. Palmer and G. N. J. Gilbert. *British Cast Iron Research Association. Journal of Research and Development,* v. 5, Aug. 1953, p. 2-14.

Describes tests on as-cast pearlitic and heat-treated ferritic irons. Discusses effect of Si addition. Tables, graphs, micrographs, diagrams, photographs.

982 The Anodic Behaviour of Copper in Neutral and Alkaline Chloride Solutions. H. Lal and H. R. Thirsk. *Chemical Society, Journal,* 1953, Sept., p. 2638-2644.

Discusses conditions under which the metal passes into solution, nature of oxide or salt deposited on anode, and effect of increasing alkalinity. Graphs.

983* Fatigue Resistance of Structural Steel Specimens Prepared by Oxygen Cutting. (Spanish.) F. Koenigsberger and Z. Garcia Martin. *Ciencia y tecnica de la Soldadura,* v. 3, no. 13, July-Aug. 1953, 10 p.

Discusses internal and external changes. Results are compared with those caused by mechanical processes. Photographs, tables, graphs.

984* Measuring the Variation of Free Energy of a Metal During Cold-Hardening. (French.) Roger Jouty. *Comptes ren-* v. 237, no. 9, Aug. 31, 1953, p. 488-489.

Proposes an electrochemical method for the above. Experimental details are described and diagrammed.

985 Some Experiments With Sleeve Bearing Metals. Borge Lunn. *Danish Academy of Technical Sciences, Transactions,* 1953, no. 2, 144 p. (T1 Ak13t)

Discusses wear and mechanical properties of bearing metals and influence of lubricants. Tables, graphs, micrographs, photographs, diagrams. 123 ref.

986* Measurement of the Melting Point of Metals at Superhigh Pressures. (Russian.) V. P. Butuzov, M. G. Gonikberg, and S. P. Simrnov. *Doklady Akademii Nauk SSSR,* v. 89, no. 4, Apr. 1953, p. 651-653.

Discusses methods for measuring temperatures higher than 200 C. Diagram, graph, table. 6 ref.

987* Correlation Between Tensile Strength and Casting Dimension for Gray Cast Iron. (Swedish.) M. Itzel and E. O. Lissell. *Gjuteriet,* v. 43, no. 8, Aug. 1953, p. 143-147.

Discusses numerous tests. Probable minimum tensile strengths have been calculated for round and rectangular cross sections of various sizes. Diagrams, graphs. 9 ref.

988 Materials for High Temperature Service. II. Howard C. Cross. *Industrial Heating,* v. 20, Oct. 1953, p. 1986, 1988, 1990, 1992, 1994-1996.

Discusses high-temperature mechanical properties of Al, Ti, Cr, and Mo. Graphs, tables. (To be continued.)

989 On the Complete Solution to Problems of Deformation of a Plastic-Rigid Material. J. F. W. Bishop. *Journal of the Mechanics and Physics of Solids,* v. 2, Oct. 1953, p. 43-53.

The problem of finding an equilibrium distribution of stress not exceeding the yield point in the assumed rigid regions of a deforming point in the assumed rigid regions of a deforming body is considered. Theorems, based on the limit-load theorems of Hill, are given for determining whether such a stress distribution exists. Graphs, diagrams. 10 ref.

990 Some Effects of Microstructure Upon Temper Brittleness. D. C. Buffum and L. D. Jaffe. *Journal of Metals,* v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 197, 1953, p. 1373-1374.

Tempered martensite was found to be more subject to temper brittleness than pearlite or ferrite. Graphs. 11 ref.

991 The Fatigue Spin Rig, A New Apparatus for Rapidly Evaluating Materials & Lubricants for Rolling Contact. E. F. Macks. *Lubrication Engineering,* v. 9, Oct. 1953, p. 254-258.

Describes apparatus which permits independent evaluation of variables that effect fatigue life of bearing balls, raceways, and lubricants over a wide temperature range. Photographs, diagrams. 63 ref.

992* Physics of Permanent Deformations. (German.) W. Späth. *Metall,* v. 7, nos. 17-18, Sept. 1953, p. 679-683.

Investigates certain fundamental phenomena of flow, thermoelectric effect as displacements, internal damping, equilibrium processes, metallurgical microprocesses, and tendency toward brittle fracture by metals. Diagrams. 28 ref.

993* On the Concept of Strain Hardening. (German.) W. Späth. *Metall,* v. 7, nos. 19-20, Oct. 1953, p. 772-778.

Presents several definitions and describes tests to demonstrate the principle. Diagrams, graphs. 13 ref.

994* Origin of Slip Lines on Plastically Deformed Metallic Surfaces. (German.) Wilhelm Spath. *Metalloberfläche,* Ausgabe A, v. 7, no. 8, Aug. 1953, p. 119-121.

Shows that ultrasonic waves are originated during slip of plastically deformed metals. Diagram. 9 ref.

995 Contribution to the Study of the Supersaturation of Iron by Cathodic Hydrogen. (French.) Jean DuFlot. *Ministere de l'Air, Publications Scientifiques et Techniques,* no. 265, 1952, 58 p. (TL507 F84.5p)

Presents a thorough study covering experimental conditions, role of Fe structure in cathodic charging, mechanical tests, and measurements. 42 ref.

996* X-Ray Lattice-Constant Measurements on Plastically Deformed Steel Specimens. *Naturwissenshaften,* v. 40, no. 19, Oct. 1953, p. 507-508.

Reviews literature comparing X-ray with mechanical measurements. Graphs. 12 ref.

997* On the Thermal Conversion of Germanium. F. van der Maesen, P. Penning, and A. van Wieringen. *Philips Research Reports,* v. 8, Aug. 1953, p. 241-244.

Describes experiments on conversion of *n*-type Ge into *p*-type by heat treatment at 800 C. Photographs. 6 ref.

998* Condition for Varnishing Spontaneous Magnetization Below the Curie Temperature. (English.) K. F. Niessen. *Physica,* v. 19, no. 5, May 1953, p. 445-450.

Discusses a method derived for a special spinel structure at a temperature below the Curie point.

999* Brillouin Zone Investigation of Mg Alloys. I. Hall Effect and Conductivity. A. I. Schindler and E. I. Salkovitz. *Physical Review,* v. 91, ser. 2, Sept. 15, 1953, p. 1320-1322.

Discusses familiar conductivity rules for alloys in the light of Jones theory. Shows that deviations from these rules are to be expected for alloys of hexagonal metals. Diagrams, graphs. 6 ref.

1000* Absorption of Infrared Light by Free Carriers in Germanium. H. B. Briggs and R. C. Fletcher. *Physical Review,* v. 91, ser. 2, Sept. 15, 1953, p. 1342-1346.

Discusses measurements of above by injecting these carriers across *p-n* junction at room temperature. Diagrams, graphs. 13 ref.

1001* The Atomic Heat of Germanium Below 4°K. P. H. Keesom and N. Pearlman. *Physical Review,* v. 91, ser. 2, Sept. 15, 1953, p. 1347-1353.

Discusses measurements of above with pure polycrystalline

and single crystal ingots; indium and antimony doped single crystal ingots; and pure crushed material. Diagram, tables, graph. 26 ref.

1002* The Hall Effect in Yttrium, Lanthanum, Cerium, Praseodymium, Neodymium, Gadolinium, Dysprosium, and Erbium. C. J. Kevane, S. Legvold, and F. H. Spedding. *Physical Review*, v. 91, ser. 2, Sept. 15, 1953, p. 1372-1379.

Reports studies on the above. Tables, diagrams, graphs. 24 ref.

1003 Thermal Conductivity of Silver at Low Temperatures. G. K. White. *Physical Society, Proceedings*, v. 66, no. 405A, Sept. 1953, p. 844-845.

Tests were made between 2 and 160 K. Graphs. 5 ref.

1004 Photoelectromagnetic and Photodiffusion Effects in Germanium. T. S. Moss, L. Pincherle, and A. M. Woodward. *Physical Society, Proceedings*, v. 66, no. 405B, Sept. 1953, p. 743-752.

Gives experimental data. Graphs. 7 ref.

1005 Edge Dislocations in Inhomogeneous Media. A. K. Head. *Physical Society, Proceedings*, v. 66, no. 405B, Sept. 1953, p. 793-801.

Gives method to reduce problems of elastic plane strain in a bimetallic medium to standard problems of potential theory. Diagram. 5 ref.

1006 The Energy Band Structure of a Linear Metal. E. P. Wohlfarth. *Physical Society, Proceedings*, v. 66, no. 406A, Oct. 1953, p. 889-893.

A tight binding calculation of the one-electron energy as a function of wave number is described for a linear of hydrogen atoms in the ground state. 12 ref.

1007 The Compressibility of Metallic Aluminium. S. Raimes. *Physical Society, Proceedings*, v. 66, no. 406A, Oct. 1953, p. 949-951.

Describes method of calculating lattice parameter, compressibility and cohesive energy using method relying on assumption that valence electrons in metal are almost free. Graph.

1008* Low Tin and Tellurium Bearing Alloy. (Polish.) S. Balicki, and W. Babinski. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 2, 1953, p. 82-88.

Investigations on mechanical properties have shown no great changes when treated at temperatures up to 100 C. Tables, graphs, micrographs. 7 ref.

1009* Determination of Potential Energy of Residual Deformations. (Russian.) G. S. Shapiro. *Prikladnaia Matematika i Mekhanika*, v. 17, no. 1, 1953, p. 114-116.

Presents a mathematical solution based mainly on torsional stresses in metallic rods. Graphs. 12 ref.

1010 Ultra High Strength Steel for Aircraft Structures. M. A. Melcon. *Product Engineering*, v. 24, Oct. 1953, p. 129-141.

Describes static, impact, and fatigue properties; notch sensitivity; fabrication; and processing. Graphs, tables. 13 ref.

1011 Yield Points in Brass Crystals. G. W. Ardley and A. H. Cottrell. *Royal Society, Proceedings*, v. 219, ser. A, Sept. 22, 1953, p. 328-341.

Reports study made on single crystals of brass grown in A or N_2. Diagrams, graphs, micrographs. 36 ref.

1012 Thermo-Electricity at Low Temperatures. I. The 'Ideal' Metals: Sodium, Potassium, Copper. D. K. C. MacDonald and W. B. Pearson. *Royal Society, Proceedings*, v. 219, ser. A, Sept. 22, 1953, p. 373-387.

Discusses electron theory of metals. Presents experimental data. Diagrams, graphs, table. 33 ref.

1013* Influence of Flame Cleaning on Properties of Steels. (German.) H. Kemper and W. Pomaska. *Schweissen und Schneiden*, v. 5, no. 7, July, 1953, p. 256-267.

Recommends working with highest possible gas-flow velocities and up to 50% excess oxygen. Critical temperatures must not be exceeded. Photographs, diagrams, tables, graphs. 4 ref.

1014* Precautions Taken During Fatigue Testing as Assemblies and Structures. (French.) H. de Leiris. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 7, July 1953, p. 203-211.

Suggests greater care in initial stages of test. Graphs, diagrams, micrograms. 9 ref.

1015* Results of Long-Time Tests on Low-Alloy Steel at 500 C and up to 100,000 Hours. (German.) A. Thum and K. Richard. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 8, Aug. 1953, p. 235-245.

Discusses the cause of deformationless fractures at high temperatures. Describes long-time creep and fatigue tests on various steels. Graphs, tables, micrographs. 10 ref.

1016* The Fatigue Testing of Structures by the Resonance Method. (English.) R. B. Heywood. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 8, Aug. 1953, p. 249-260.

Describes machines for testing at or near resonance with special reference to testing of aircraft structures. Describes new "slip clutch" type of exciter. Diagrams, graphs, photographs. 12 ref.

1017* Design Strength and Wearing Quality of High-Strength Gear Wheels. (German.) A. Thum and K. Richard. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 9, Sept. 1953, p. 267-278.

Present critical discussion on the basis of experiments and a review of the literature. Outlines the effect of the material, direction of the grain, heat treatment, and tooth size and shape. Diagrams. 45 ref.

1018* Notched-Bar Impact Testing According to H. M. Schnadt. (German.) Alfred Krisch. *Stahl und Eisen*, v. 73, no. 19, Sept. 1953, p. 1215-1225.

Schnadt's theory is correlated with Huber-von Mises-Hecky hypothesis. Stress ratios for ductile and brittle fracture are considered. Variations of impact testing are discussed. Graphs, tables, diagrams, photographs. 36 ref.

1019* Behavior of Steel at Elevated Temperature. (German.) Alfred Krisch. *Stahl und Eisen*, v. 73, no. 21, Oct. 1953, p. 1349-1355.

Presents review of literature published in 1951. Discusses change of elastic constants, creep tests, high-temperature property investigations, stress-relief tests, and effect of chemical composition. Tables, graphs. 45 ref.

1020* Turning of Parts Built-Up with "Sormaite." (Russian.) E. A. Belousova and A. Ia. Malkin. *Stanki i Instrument*, v. 24, no. 5, May 1953, p. 10-13.

Gives composition and mechanical properties of a 13-25% Cr-Fe alloy used to build-up wear resistant surfaces. Techniques of machining built-up parts are presented. Tables, diagrams.

1021 Stress Analysis and Design of Steel Columns. Henson K. Stephenson and Kriss Cloninger, Jr. *Texas Engineering Experiment Station, Bulletin* 129, Feb. 1953, 287 p. (T21 T31b)

Furnishes practical information needed for stress analysis and design of columns and other compression members which will effectively reduce and in some cases eliminate the tedious and time-consuming labor ordinarily required for solving many of the theoretical and practical problems associated with column action. Tables, graphs.

1022 Coefficient of Friction and Damage to Contract Area During the Early Stages of Fretting. I. Glass, Copper or Steel Against Copper. Douglas Godfrey and John M. Bailey. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3011, Sept. 1953, 23 p. (TL570 Un3t)

Includes graphs, tables, diagram, photograph, micrograph. 6 ref.

1023 Axial-Load Fatigue Tests on Notched and Unnotched Sheet Specimens of 61S-T6 Aluminum Alloy, Annealed 347 Stainless Steel, and Heat-Treated 403 Stainless Steel. Herbert F. Hardrath, Charles B. Landers, and Elmer C. Utley, Jr.

31. *Metals—Mechanical and Physical Properties*

U. S. National Advisory Committee for Aeronautics, Technical Note 3017, Oct. 1953, 28 p. (TL570 Un3t)

The stress-concentration factors effective in fatigue of notched specimens were found to be less than theoretical elastic values at low stresses and were approximately equal to one at the ultimate strength. Graphs, tables. 11 ref.

1024 Investigation of the Statistical Nature of the Fatigue of Metals. G. E. Dieter and R. F. Mehl. *U. S. National Advisory Committee for Aeronatuics, Technical Note* 3019, Sept. 1953, 25 p. (TL570 Un3t)

Utilizes statistical methods to study the scatter found in Al alloys an effect of the morphology of the carbide phase on scatter in a eutectoid steel. Graphs, tables. 11 ref.

1025* Friction and Wear Resistance Tests on Unhardened and Hardened Sheet Steel for Conveyor Chutes. (German.) K. Wellinger and H. Uetz. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 95, no. 26, Sept. 11, 1953, p. 906-910.

Describes tests made to determine relative usefulness of soft and hard sheet steel. Diagrams, tables, graphs.

1026* Endurance of Working Surfaces of Teeth Under Variable Load. (Russian.) Z. P. Pavlov. *Vestnik Mashinostroeniia,* v. 33, no. 3, Mar. 1953, p. 16-20.

Compares surface wear on nonhardened gears with constant and variable load. Tables, graphs.

1027* Investigation of Antifriction Properties of Chromium with Mechanical Porosity. (Russian.) D. N. Garkunov and A. A. Poliakov. *Vestnik Mashinostroeniia,* v. 33, no. 6, June 1953, p. 65-67.

Compares mechanical and electrolytic porous Cr for wear and friction coefficients. Photographs.

1028 Arc Welding of Low Chromium-Molybdenum Steel Pipe. Jay Bland. *Welding Journal,* v. 32, Sept. 1953, p. 803-814.

Describes correlation between hardness and ductility and between hardness and tensile strength in pipe and weld deposits. Photographs, graphs, tables. 7 ref.

1029 Load-Carrying Capacity of Fillet Weld Connections. F. Koenigsberger and H. W. Green. *Welding Journal,* v. 32, Sept. 1953, p. 859-863.

Discusses static and fatigue loading. Diagrams, graphs, photographs, tables.

1030 Heat-Treatment Effects on Transition Temperature of a Ship Steel. E. B. Evans and L. J. Klingler. *Welding Journal,* v. 32, Sept. 1953, p. 417s-431s.

Presents investigation on various subcritical heat treatments on ductility of a 1025 semi-skilled steel. Tables, diagrams, graphs, micrographs. 9 ref.

1031 Fatigue Properties of Weld Metal. L. A. Harris, R. B. Matthiesen, and N. M. Newmark. *Welding Journal,* v. 32, Sept. 1953, p. 441s-453s.

Describes properties of specimens deposited with E7016 low-hydrogen electrodes with E6010 high-hydrogen electrodes. Tables, macrograph, micrographs, graphs, diagrams. 11 ref.

1032 Scale Effect in Notch Brittleness. Yoshio Akita. *Welding Journal,* v. 32, Sept. 1953, p. 475s-480s.

Describes tests on mild steel specimens of geometrically similar shape. Tables, graphs.

1033* Speeding the Flow of Metals in Paraffin Oil by Addition of Polar Compounds. (German.) Werner Klinkenberg, Kurt Lücke, and Georg Masing. *Zeitschrift für Metallkunde,* v. 44, no. 8, Aug. 1953, p. 362-369.

Experiments were made on the effect of surface active substances dissolved in polar compounds on plastic flow of very thin specimens. Attention was paid to Rehbinder effect which was observed on Au. Diagrams, graphs. 36 ref.

1034 Prperties of Metallic Melts. VI. Internal Friction of Liquid Silver-Tin Alloys. (German.) Erich Gebhardt, Manfred Becker, and Erich Trägner. *Zeitschrift für Metallkunde,* v. 44, no. 8, Aug. 1953, p. 379-382.

Discusses dependence on temperature and concentration. Graph, table. 14 ref.

1035* Nomograph for Determining Course of Tension During Pure Bending for Materials With Linear Solidification. Rudolf Böklen. *Zeitschrift für Metallkunde,* v. 44, no. 8, Aug. 1953, p. 382-386.

Plots flow curve from equilibrium moments during loading and unloading to represent distribution of stresses in rectangular and circular bars. Graph, diagrams, tables, photograph. 6 ref.

1036* Decomposition of Mg^{27}. (German.) H. Daniel, L. Koester, and Th. Mayer-Kuckuk. *Zeitschrift für Naturforschung,* v. 8a, no. 7, July 1953, p. 447-448.

Discusses three methods of investigation by measuring emission of β and γ rays. 10 ref.

1037* Electical Properties of InSb. (German.) H. Weiss. *Zeitschrift für Naturforschung,* v. 8a, no. 8, Aug. 1953, p. 463-469.

Discusses measurements of conductivity, Hall effect, and magnetic resistance change. Graphs, diagrams. 8 refs.

Books and Miscellaneous Publications

1038 Physical Constants of Some Commercial Steels at Elevated Temperatures. BISRA, Metallurgy Div., Thermal Treatment Sub-Committee. 38 p. 1953. Butterworths Scientific Publications, London. (TS320 B77p)

The constants are of interest to engineers, metallurgists, and others concerned with the heat treatment of steels. Adaption of a uniform temperature interval should make reference to the tables easy.

1039 Fatigue of Metals. R. Cazaud. Translated from the French by A. J. Fenner. 334 p. 1953. Chapmna & Hall, London. (TA460 C31f3tr)

Includes chapters on "Historical Note", "Characteristics of Fatigue Failures", Mechanism of Fatigue of Metals-Theories", "Fatigue Tests and Testing Machines", "Fatigue Limits of Metals and Alloys", "Influence of Various Factors on Fatigue Strength", "Fatigue Strength of Structural Joints", and "Improving the Fatigue Strength of Machine Components".

1040 The Nimonic Alloys. Ed. 2. 41 p. 1952. Henry Wiggin & Co., England. (Pamphlet File.)

Data on mechanical properties of "Nimonic" alloys are presented in tabular form.

See also:

350 (properties of high-Cr alloy)
359 (Properties of Ti alloys)
804 (properties of Ta and Zr)
906 (properties of Ti-Al-Mo alloys)
907 (properties of Ti-Al-Cr alloys)
922 (properties of annealed cast iron)
933 (properties of Cu and Cu alloys)
937 (properties of quenched Bessemer steels)
1094 (deformation of Al single crystals)
1143 (properties of Mg alloys)
1146 (ferromagnetic methods of studying deformation processes)
1176 (thermal conducting of metal powders)
1416 (properties of welded joints)
1420 (mechanical properties of Ti)
1421 (strength of low-alloy steels)

32. METALS—MECHANICAL WORKING

1041* Forging Tolerance. H. G. Conway. *Aircraft Production,* v. 25, Oct. 1953, p. 358-361.

Discusses sources of error, tolerance standards, and their application. Graphs, tables, diagrams.

1042* Influence of Silicon in Aluminum on Longevity of Cutting Tools. (German.) H. Lindqvist. *Aluminium.* v. 29, no. 9, Sept. 1953, p. 375-377.

Reports test data from machining Al alloys containing Si. Graphs, diagram.

1043* Increasing Output by Cold Pressing Light Metals. (German.) H. Hornauer. *Aluminium*, v. 29, no. 10, Oct. 1953, p. 405-413.

Discusses characteristics and shows that work hardening can be avoided. Describes greater economy of tools and materials and lowered assembly costs realized by dispensing with the annealing operation. Diagrams, graphs, photographs, tables, micrographs. 12 ref.

1044* High-Strength Wrought Aluminum Alloys Without Nickel. (Hungarian.) *Aluminium, (Budapest)*, v. 5, no. 5, May 1953, p. 97-103.

Reports on investigations on the forging technology of Al-Mg-Si-Cu and Al-Mg-Zn type alloys. Diagrams, graphs, micrographs. 14 ref.

1045* Some Aspects of the Hot-Extrusion and Piercing of Copper and Copper Alloy Billets for Tube Manufacture. I. Flow and Lubrication in Tube Extrusion. Clement Blazey. **II. Rotary Piercing.** Robert J. B. Pearson. *Australasian Engineer*, 1953, Aug. 7, p. 53-60.

Includes diagrams. 19 ref.

1046 Automatic Stamping and Welding of Sheet Metal Parts. *Automotive Industries*, v. 109, Oct. 1, 1953, p. 48-49.

Describes equipment. Photographs.

1047 Custom-Rolled Paper-Thin Metals for Aircraft. Monroe Sherman. *Aviation Age*, v. 20, Oct. 1953, p. 28-29.

Brief discussion of production and use of strip in thicknesses down to 0.0005 in. Photographs.

1048 Working with Titanium. Norman S. Currey. *Aviation Age*, v. 20, Oct. 1953, p. 134-139.

Discusses technical and financial aspects of forming, welding, and machining. Tables, photographs.

1049 Spinning vs. Drawing. II. J. Lenbridge. *Canadian Metals*, v. 16, Oct. 1953, p. 48, 50.

Presents evaluation of the above, which can compete with or supplement each other according to economics involved in individual cases. Table.

1050 Lubrication in Metal Cutting. *Canadian Metals*, v. 16, Oct. 1953, p. 62, 64.

Gives an evaluation of part played by cutting fluids in machining operations and some causes of tool failure. Graphs, table.

1051 Electric Spark Erosion as Applied to Metal Machining. D. W. Rudorff. *Engineers' Digest*, v. 14, Oct. 1953, p. 373-377.

Discusses equipment, principles and techniques of the "Sparcatron" process. Photographs, diagrams.

1052 How Do Boron Steels Compare in Machinability? Norman Zlatin, J. F. Kahles, and W. R. Friedlander. *Iron Age*, v. 172, Oct. 29, 1953, p. 94-97.

Reports tests comparing machining characteristics with equivalent standard alloy steels. Graphs, tables.

1053 Calculations on Sheet-Drawing Under Back Tension Through a Rough Wedge-Shaped Die. J. F. W. Bishop. *Journal of the Mechanics and Physics of Solids*, v. 2, Oct. 1953, p. 39-42.

Based on the Hill-Tupper theory, a single emperical formula expressing drawing stress as a function of die semi-angle, coefficient of friction, reduction, and back-tension, is derived. Graphs. 5 ref.

1054 Aluminum Tubing. Small Diameter and Thin Walls Obtained by Extrusion. Gilbert C. Close. *Light Metal Age*, v. 11, Oct. 1953, p. 8-9, 28.

Describes equipment, plant layout, and procedure. Photographs.

1055 Flat-Die Forging of Cast-Titanium Ingots. J. F. Nelson. *Machinery*, v. 60, Oct. 1953, p. 164-168.

Gives experiences and recommendations of one company. Photographs.

1056 Light Machining Operations on Die Castings. H. K. Barton. *Machinery (London)*, v. 83, Sept. 25, 1953, p. 631-638.

Discusses flash removal, dimensional accuracy, and providing special features. Diagrams.

1057 Cold Extrusion of Steel. *Machinery (London)*, v. 83, Oct. 2, 1953, p. 657-662.

Describes tool design and die steel. Diagrams, tables. 4 ref.

1058 Making Hollow Steel Propeller Blades. *Machinery (London)*, v. 83, Oct. 16, 1953, p. 757-766.

Describes step-by-step manufacture of above by de Havilland Propellers, Ltd. Photographs, diagrams.

1059* Boring Large Tapers on Small Lathes. Tom Brown. *Machine and Tool Blue Book*, v. 49, Sept. 1953, p. 185-186, 188.

Includes diagram.

1060* Machining Nickel Alloy Steels. G. P. Witteman. *Machine and Tool Blue Book*, v. 49, Oct. 1953, p. 164-170, 172-174, 176, 178, 180, 185-186, 188, 190.

Discusses machinability in respect to hardness and microstructure. Micrographs, tables, diagrams, photograph.

1061 Where Shot Peening Can Be Used to Advantage. John L. Everhart. *Materials & Methods*, v. 38, Oct. 1953, p. 110-113.

Describes applications in straightening and forming, decreasing stress corrosion cracking, reducing porosity in castings, and testing quality of plating. Photographs, graph, table.

1062 Non-Ferrous Wire Production. *Metal Industry*, v. 83, Sept. 25, 1953, p. 255-258.

Describes wire rolling and drawing processes. Photographs.

1063 Aluminum Rolling and Extrusion. *Metal Industry*, v. 83, Oct. 2, 1953, p. 275-278.

Describes equipment, plant layout, and procedure. Photographs.

1064* Cold Extrusion Molding. (German.) F. Mass. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 689-692.

Discusses basic processes, choice of materials, preparatory procedures, and molding. Diagrams, graph.

1065* Influence of Certain Impurities on Machining Brass Stock. (German.) K. Schimz. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 700-701.

Discusses influence of Fe and Al. Tables.

1066* Grinding Agents for Hard-Metal Tools. (German.) *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 701-703.

Describes use of diamonds as abrasives. Table.

1067* Damage by Grinding and Polishing Materials. (German.) Walter Burkart. *Metalloberfläche*, Ausgabe B, v. 5, no. 9, Sept. 1953, p. 137-138.

Discusses behavior of quartz, natural corundum, tripoli earth, iron oxide, chromium oxide, and clay. 2 refs.

1068* Shot Peening in the Steelmaking Industry. (French.) Guy Giudicelli. *Métallurgie et la construction mécanique*, v. 85, no. 9, Sept. 1953, p. 723-729.

Outlines difference between shot peening and descaling. Machinery and methods for shot peening and its specialized application are described. Photographs.

1069 From Smelted Aluminum to Finished Sash With Presses. Walter Rudolph. *Modern Industrial Press*, v. 15, Oct. 1953, p. 36, 38, 40, 42.

Describes extrusion equipment, plant layout, and operating procedure. Photographs.

1070* Comparison of Calculation Methods for Roll Pressure in Cold Rolling of Strips. (Polish.) K. Filasiewicz, Z. Wusatowski and A. Galanty. *Prace Instytutow Ministerstwa Hutnictwa*, v. 5, no. 2, 1953, p. 57-81.

Presents critical considerations of theoretical formulae and practical methods. Tables, graphs. 21 ref.

32. *Metals—Mechanical Working*

1071* The Hot Pressing of Copper Alloys. (French-German.) *Pro-Metal*, v. 6e, no. 34, Aug. 1953, p. 203-210.

Discusses materials, dies, die design, and advantages of hot-pressing methods. Diagrams, photographs.

1072* The Effect of Impurities in Free-Machining Brass. (German-French.) *Pro-Metal*, v. 6e, no. 34, Aug. 1953, p. 211-213.

Experiments have shown that up to 0.35% Fe or 0.2% Al do not reduce machinability of brass or life of the cutting tool. Diagrams, table, graph.

1073* "ESA" A New Electric Arc-Oxygen Cutting Process. (German.) E. Brünn and F. Erdmann-Jesnitzer, v. 7, no. 6, June 1953, p. 68-70.

Describes principle, procedure, and equipment; shows process is superior and more economical than other cutting methods. Photographs.

1074 The Forming of Aluminum Sheet. I. The Characteristics of the Metal. H. Hinxman. *Sheet Metal Industries*, v. 30, no. 318, Oct. 1953, p. 847-850, 878.

Discusses fundamental concepts of usage of Al and Al alloy sheet. Table, photograph. (To be continued.)

1075* Relationship Between Machinability and Other Properties of Materials. (German.) Franz Rapatz. *Stahl und Eisen*, v. 73, no. 18, Aug. 27, 1953, 1169-1174.

Explains development and forms of wear and means of influencing it. Chip shapes, faster cutting speeds, embrittlement, increased material strength, and reduced friction coefficients are considered. Photographs, graphs. 15 ref.

1076* Stamping of Rolled Material in Hot Saws, Hot Shears, and Dressing Machines. (German.) Herbert Zimmer. *Stahl und Eisen*, v. 73, no. 18, Aug. 27, 1953, p. 1174-1176.

Explains significance of stamping methods and how they are carried out. Photographs, diagrams.

1077* The Formation of Surface Defects in the Hot-Working of Steel Due to Copper and Tin Impurities. (German.) Kurt Born. *Stahl und Eisen*, v. 73, no. 20, Sept. 24, 1953, p. 1268-1277; disc., p. 1277-1280.

High-temperature bending tests reveal surface cracking between 950 and 1150 C. Photographs, micrographs, graphs, tables. 14 ref.

1078* Anodic-Mechanical Grinding of Circular Cutting Tools With Tips of Hard Alloys. (Russian.) G. P. Slesarchuk. *Stanki i Instrument*, v. 24, no. 4, Apr. 1953, p. 20-21.

Method results in absence of cracks in tips, cleaner working surfaces, and higher productivity. Diagrams.

1079 Impact Extrusion of Magnesium. *Steel*, v. 133, Oct. 26, 1953, p. 114-116.

Describes metal flows at 350 to 500F and at about half the pressure needed for Al. Reports light weight products resist corrosion and have a good electrical and heat conductivity. Photographs, diagram, graph.

1080 Evaluating Rolling Pressures in Hot and Cold Strip Mills. N. H. Polakowski. *Steel*, v. 133, Nov. 2, 1953, p. 96, 98, 100, 103-104.

Reviews methods for prediction and direct measurement of roll separating forces under operating conditions. Tables, photographs, diagrams. 7 ref.

1081 Hot Working Steels in the Forge and Their Treatment. W. Eilender and R. Mintrop. *Steel Processing*, v. 34, Oct. 1953, p. 509-515.

Reports survey of most frequently used hot-forging steels and their properties. Factors which should be considered during heat treating are given. Table, graphs.

1082* Magnesium Forming. I. General Considerations. Francis L. Coenen. *Tool Engineer*, v. 31, Nov. 1953, p. 43-49.

Presents some general rules, based on production data, that they may serve as guides in planning processes and equipment. Photographs, tables, graphs, diagrams. (To be continued.)

1083* Selection of Punch Tip Radius for Free Bending. (Russian.) I. P. Renne. *Vestnik Mashinostroeniia*, v. 33, no. 5, May 1953, p. 35-41.

Discusses effect of tip radius on radius of curvature of articles formed from various materials. Diagrams, graphs, table. 3 ref.

1084* Machining Costs of Iron Castings Cut With Cupola Deoxidation Process. *Western Metals*, v. 11, Oct. 1953, p. 66-68.

Discusses technique, requirements of good deoxidizer, and effects of processing on microstructure. Photographs, graphs.

1085 Processing of Phosphor Bronze Wire. Earle W. Lovering. *Wire and Wire Products*, v. 28, Oct. 1953, p. 1039-1041.

Discusses common bronzes and their properties. Tables, graphs, photographs.

1086 The Drawing of Shaped Steel Wire. Vito J. Vitelli. *Wire and Wire Products*, v. 28, Oct. 1953, p. 1042-1043, 1046.

Discusses continuous process. Photographs, diagrams.

See also:

403 (drives and controls for rolling mills)
738 (cutting of metals)
902 (working of metals)
976 (cold drawing of steel)
1020 (machining Cr-Fe alloy)

33. METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES

1087 The Growth of Strain-Anneal Crystals of Predetermined Orientation. (English.) G. K. Williamson and R. E. Smallman. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 487-491.

Presents principles and methods of growing crystals of any desired orientation in superpure Al and its alloys. Diagrams. 16 ref.

1088 The Kinetics of AuCu and $AuCu_3$. (German.) U. Dehlinger. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 492-494.

The lower rate of disorder-order transformation in deformed crystals is explained as a function of the number of atoms in a stable nucleus. 6 ref.

1089 Self-Diffusion in Zinc. (English.) G. A. Shirn, E. E. Wajda, and H. B. Huntington. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 513-518.

Radioactive Zn was used as a tracer. It is shown that at least two mechanisms are involved. Graphs, tables. 5 ref.

1090 The Effects of Neutron Irradiation in the NRX Reactor on the Order-Disorder Alloy Cu_3Au. (English.) L. G. Cook and R. L. Cushing. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 539-548.

Volume disordering was observed with fission spectrum neutrons and a secondary ordering effect was apparently induced by thermal neutrons. Tables, graphs, diagrams. 10 ref.

1091 The Effects of Neutron Irradiation in the NRX Reactor on the Order-Disorder Alloy CuAu. (English. L. G. Cook and R. L. Cushing. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 549-551.

Disordering was caused by fast neutrons. Thermal neutrons apparently caused secondary ordering. Tables, graphs.

1092 An X-Ray Investigation of Age Hardening in AlAg. (English.) C. B. Walker and A. Guinier. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 568-577.

Experimental data confirm Kuinier's explanation of the precipitation mechanism for a 20% Ag-Al alloy. Graphs, diagrams. 17 ref.

1093 The Diffusivity of Carbon in Iron by the Steady-State Method. (English.) R. P. Smith. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 578-587.

Tests were made at 1000, 851, and 802 C with different carbon contents at the cylinder surfaces. Diagrams, tables, charts. 22 ref.

1094 A Study of Deformed and Recovered Aluminum Crystals by a New X-Ray Technique. (English.) C. A. Julian and B. D. Cullity. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 588-597.

Describes method of detecting and measuring torsional strain in a crystal lattice. Plastic deformation was found to be inhomogeneous and reversible in Al single crystals. Diagrams, photographs. 13 ref.

1095 On a Statement by C. S. Smith Concerning an Upper Limit to the Sharing of Corners in Aggregates. (English.) J. L. Meijering. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 607.

Author reasons that the ratio of corners to number of crystals can be more than six.

1096 The High Temperature Hexagonal Phase of Cobalt. (English.) A. G. Metcalfe. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 609-610.

Previously published data are used to indicate that grain size may be very significant in transformation studies. Graph. 6 ref.

1097 A "Sub-Regular" Solution Model Applied to the Immiscibility Curve in Liquid Lead-Zinc Alloys. (English.) H. K. Hardy. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 610-611.

Shows that only one empirical constant is required for this calculation. Graphs. 4 ref.

1098 Triple N_2 Carbides and the Atomic Size Factor. (English.) Kehsin Kuo. *Acta Metallurgica*, v. 1, no. 5, Sept. 1953, p. 611-612.

Experimental data show the existance of three triple carbides in Ti-Ni-Ta-C, Ti-Co-Ta-C, and Ti-Ni-Nb-C alloys. 4 ref.

1099* Field Electron Microscopic Observations on Cathodes with Cubic Body-Centered and Cubic Face-Centered Lattice Structure. (German.) H. Birkenshenkel, R. Haefer, and P. Mezger. *Acta Physica Austriaca*, v. 7, no. 4, 1953, p. 402-416.

Describes a tungsten-cathode method for investigating Mo, Ta, and Ni. Diffraction patterns, diagrams, tables. 18 ref.

1100* Effect of Microstructure of Unalloyed Steels on Their Workability. (German.) O. Szabo. *Acta Technica Academiae Scientiarum Hungaricae*, v. 6, nos. 3-4, 1953, p. 351-386.

Discusses effect of carbide distribution on strength, workability, and hardenability. Tables, graphs, micrographs, photographs. 14 ref.

1101 Carbon in Ferrous Alloys. Harry K. Ihrig and John T. Jarman. *American Foundryman*, v. 24, Nov. 1953, p. 52-57.

Reports series of experimental heats demonstrating how amount and form of carbon influence structures of ferrous alloys. Photographs, tables, diagrams, graphs. 8 ref.

1102 Isothermal Transformation of Titanium-Manganese Alloys. P. D. Frost, W. M. Parris, L. L. Hirsch, J. R. Doig, and C. M. Schwartz. *American Society for Metals, Preprint no.* 7, 1953, 16 p. (TS300 Am35t)

Observations were made on binary Ti alloys containing 2.91, 7.72, and 12.3 wt. % Mn at temperatures between 450 and 650 C. Tables, graphs, micrographs. 5 ref.

1103 A Time-Temperature Relationship for Recrystallization and Grain Growth. F. R. Larson and J. Solmas. *American Society for Metals, Preprint no.* 10, 1953, 22 p. (TS300 Am35t)

A parameter which evaluates relative effects of time and temperature was applied to recrystallization and grain growth. Tables, graphs. 21 ref.

1104 The System Zirconium-Aluminum. J. D. McPherson and M. Hansen. *American Society for Metals, Preprint no.* 13, 1953, 18 p. (TS300 Am35t)

The complete phase diagram for arc-cast and heat treated specimens was established by metallographic analyses, X-ray diffraction, incipient melting, and thermal analysis studies. Tables, graphs, micrographs. 10 ref.

1105 Supercooling and Dendritic Freezing in Alloys. W. C. Winegard and B. Chalmers. *American Society for Metals, Preprint no.* 16, 1953, 10 p. (TS300 Am35t)

Shows that supercooling may result from enrichment in solute of the liquid immediately ahead of the advancing solid-liquid interface. Graphs, diagrams. 10 ref.

1106 The Effect of Pearlite Spacing on Transition Temperature of Steel at Four Carbon Levels. John A. Rinebolt. *American Society for Metals, Preprint no.* 18, 1953, 11 p. (TS300 Am35t)

Tables, graphs, micrographs. 7 ref.

1107 A Hypothesis for the Boron Hardenability Mechanism. J. W. Spretnak and Rudolph Speiser. *American Society for Metals, Preprint no.* 20, 1953, 32 p. (TS300 Am35t)

Discusses importance of the allotropic transformation in determining kinetics of decomposition of austenite. Tables, graphs. 37 ref.

1108 A Study of the Fe-Fe_2B System. C. C. McBride, J. W. Spretnak, and Rudolph Speiser. *American Society for Metals, Preprint no.* 22, 1953, 22 p. (TS300 Am35t)

The solubility of B in Fe was determined by equilibrating Fe-Fe_2B sandwiches and analyzing the resultant cores spectrographically for B. Tables, graphs, micrographs. 12 ref.

1109 Microstructural Changes on Tempering Iron-Carbon Alloys. B. S. Lement, B. L. Averbach, and Morris Cohen. *American Society for Metals, Preprint no.* 25, 1953, 27 p. (TS300 Am35t)

Presents electron micrographic study of microstructural changes that occur in high purity Fe-C alloys during tempering up to 700 F. Tables, graphs, micrographs.

1110 Equilibrium Structures in Fe-Cr-Mo Alloys. J. G. McMullin, S. F. Reiter, and D. G. Eberling. *American Society for Metals, Prepirnt no.* 28, 1953, 8 p. (TS300 Am35t)

Presents isothermal sections of the Fe-Cr-Mo ternary diagram at 1500 and 1650 F. Tables, graphs, micrographs. 10 ref.

1111 A Survey of Vanadium Binary Systems. W. Rostoker and A. Yamamoto. *American Society for Metals, Preprint no.* 29, 1953, 26 p. (TS300 Am35t)

Summarizes pertinent information on terminal solubility limits, identities of intermediate phases, and reactions between intermediate phases and terminal solid solutions of 21 binary systems. Tables, graphs, micrographs. 67 ref.

1112 Gamma Loop Studies in the Iron-Vanadium and the Iron-Vanadium-Titanium Systems. William R. Lucas and W. P. Fishel. *American Society for Metals, Preprint no.* 30, 1953, 13 p. (TS300 Am35t)

Dilatation studies were made to determine the Ac_3 transformation temperatures. Tables, graphs, photographs. 9 ref.

1113 High Temperature Transformations in Ferritic Stainless Steels Containing 17 to 25% Chromium. A. E. Nehrenberg and Peter Lillys. *American Society for Metals, Preprint no.* 31, 1953, 28 p. (TS300 Am35t)

Studies were made of complex isothermal transformations which occur in both austenite and delta ferrite of commercial 17, 21, and 25% Cr steels heated sufficiently for complete solution of carbides. Table, graph, micrographs. 21 ref.

1114 Grain Growth in High Speed Steel. Eric Kula and Morris Cohen. *American Society for Metals, Preprint no.* 33, 1953, 26 p. (TS300 Am35t)

Discusses formation of fiish-scale fracture during re-austenizing of previously hardened steels. Graphs, micrographs. 23 ref.

1115 Discontinuous Grain Growth in High Speed Steel. Arthur H. Grobs, George A. Roberts, and D. S. Chambers. *American Society for Metals, Preprint no.* 34, 1953, 30 p. (TS300 Am35t)

Discusses fish-scale fracture formation in 8 commercial high speed steels. Tables, graphs, micrographs. 4 ref.

33. *Metals—Metallography, Transformations, and Structures*

1116 Strain Aging Behavior of Rheotropically Embrittled Steel. E. J. Ripling. *American Society for Metals, Preprint no.* 35, 1953, 11 p. (TS300 Am35t)

The rhotropic recovery produced in a steel heat treated to a high hardness level is shown to persist through a second tempering treatment. Graphs. 9 ref.

1117 Notch-Bar Tensile Properties of Various Materials and Their Relation to the Unnotch Flow Curve and Notch Sharpness. Harry Schwartzbart and W. F. Brown, Jr. *American Society for Metals, Preprint no.* 37, 1953, 24 p. (TS300 Am35t)

Discusses effects of strain hardening characteristics and notch sharpness on notch tensile properties. Table, diagram, graphs. 11 ref.

1118 Solution and Precipitaiton of Aluminum Nitride in Relation to the Structure of Low Carbon Steels. W. C. Leslie, R. L. Rickett, C. L. Dotson, and C. S. Walton. *American Society for Metals, Preprint no.* 1W, 1953, 28 p. (TS300 Am35t)

Temperature required for complete solution was investigated. Effects of composition, solution temperature and prior cold work on rate of isothermal precipitation was determined. Influence of AlN on microstructure of cold-rolled, box-annealed sheet steel was studied. Tables, graphs, micrographs. 12 ref.

1119 Roles of Aluminum and Nitrogen in Graphitization. E. J. Dulis and G. V. Smith. *American Society for Metals, Preprint no.* 2W, 1953, 11 p. (TS300 Am35t)

Gives results of tests on cementite decomposition of 8 steels. Tables, micrographs. 6 ref.

1120 Effective Diameter of Solute Atoms in Interstitial Solid Solutions. Rudolph Speiser, J. W. Spretnak, and W. J. Taylor. *American Society for Metals, Preprint no.* 4W, 1953, 6 p. (TS300 Am35t)

Formulas were derived. Tables. 10 ref.

1121 The Influence of Heat Treating Variables on the Martensite Transformation in SAE 1050 Steel. Melvin R. Meyerson and Samuel J. Rosenberg. *American Society for Metals, Preprint no.* 8W, 1953, 26 p. (TS300 Am35t)

The effects of austenitizing temperature austenite grain size and rate of cooling were determined. Tables, graphs, micrographs. 32 ref.

1122 The Formation of Sigma Phase in Types 309 and 310 Stainless Steel. R. C. Frerichs and C. L. Clark. *American Society for Metals, Preprint no.* 9W, 1953, 12 p. (TS300 Am35t)

Discusses structural and physical changes occuring as a result of aging at elevated temperatures. Micrographs, table, diagrams. 9 ref.

1123 Application of New Etchants for Delineation of Fine Structure in Steel. A. E. Austin. *American Society for Testing Materials, Preprint no.* 94b, 1953, 5 p. (TA401 Am35p)

Comparison was made of structures of pearlite, bainite and tempered martensite as revealed by various etchants. Micrographs.

1124 Positive Versus Negative Plastic Replicas. C. M. Schwartz. *American Society for Testing Materials, Preprint no.* 94c, 1953, 5 p. (TA401 Am35p)

Compares the 2 methods and describes experimental work on electron microscopy. Micrographs.

1125 Techniques for the Study of Precipitated Carbides. W. D. Forgeng and John L. Lamont. *American Society for Testing Materials, Preprint no.* 94d, 1953, 17 p. (TA401 Am35p)

Describes a polyvinyl formal method and its modifications. Micrographs. 8 ref.

1126* Segregation Phenomena in Nickel Steels. (German.) Klaus Janssen, Eduard Houdremont, and Werner Jellinghaus. *Archiv für das Eisenhüttenwessen*, v. 24, nos. 7-8, July-Aug. 1953, p. 323-332.

Presents examples of solid-state segregation. Graphs, photographs, table. 8 ref.

1127* Isothermal Time-Temperature Diagrams of Useful Tool Steels. (German.) Max Kroneis, Reinhold Gettringer, Kurt Ebner, and Helmut Krainer. *Archiv fur das Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 333-351.

Reports diagrams for 24 alloy steels. Diagrams, graphs, table.

1128* Influence of State of Material on Hydrogen Diffusion in Unalloyed Steel. (German.) Hermann Schumann and Friedrich Erdmann-Jeanitzer. *Archiv fur das Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 353-360.

Discusses influence of varying degree of cold deformation and recrystallization on behavior of H_2 in low C steel. Photographs, graphs, diagrams, table. 23 ref.

1129* Phase Diagram: Iron-Iron Phosphide-Molybdenum Phosphide-Molybdenum. (German.) Rudolf Vogel and Dietrich Horstmann. *Archiv fur das Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 369-374.

Shows existence of a eutectic between Mo and MoP. Molybdenum exhibits a stronger affinity for P than does Fe. Graphs, photographs, diagrams. 8 ref.

1130* Applications of X-Ray Diffraction Analysis in the Environmental Field. D. Lennox and J. Leroux. *Archives of Industrial Hygiene and Occupational Medicine*, v. 8, Oct. 1953, p. 359-370.

Shows usefulness of X-ray diffraction in identification and quantitation of many crystalline materials. 12 ref.

1131* Nonuniform Crystallization During Welding. (Russian.) S. V. Avakian, N. F. Lashko, and O. P. Shlykov. *Avtogennoe Delo*, v. 24, no. 6, June 1953, p. 12-16.

Discusses effects of cooling Al-Cu and Al-Si systems at different rates. Graphs, micrographs.

1132* Effect of Certain Dissolved Additions on the Frontal Diffusion of Silver in Polycrystalline Copper. (Russian.) V. I. Arkharov, S. I. Ivanovskaia, and N. N. Skorniakov. *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 669-672.

Discusses effect of small additions of Fe. Micrographs, table.

1133* Dispersion of X-Rays by Metals in the Region of Very Small Angles. (Russian.) B. M. Rovinskii and V. M. Genkin. *Doklady Akademii Nauk, SSSR*, v. 89, no. 4, Apr. 1953, p. 673-675.

Discusses dispersion by pure metals. Graphs. 6 ref.

1134* Thermodynamics of Simple Carbides in Steel. (Russian.) N. S. Fastov and B. N. Winkel'shtein. *Doklady Akademii Nauk SSSR*, v. 89, no. 4, Apr. 1953, p. 677-679.

Discusses quantity and composition of carbide phase depending on composition of the steel and its thermal treatment.

1135* Structure of Martensite Crystals of Hardened Steel. (Russian.) M. P. Arbuzov, L. I. Lysak, and E. G. Nesterenko. *Doklady Akademii Nauk SSSR*, v. 90, no. 3, May 21, 1953, p. 375-377.

X-ray diffraction was use to study size and distortions of structural units. Tables, graph. 6 ref.

1136 Progress in Metallurgical Microscopy. B. W. Mott. *Endeavour*, v. 12, July 1953, p. 154-161.

Reviews advances in techniques for investigating surface topography, polarized light, and microscopy of hot metal surfaces. Diagrams, micrographs. 41 ref.

1137 S-Curves. E. Gillam and D. G. Cole. *Iron & Steel*, v. 26, Oct. 1953, p. 471-474.

Discusses development of an X-ray method to follow submartensitic transformations in steels. Diagrams, graphs, tables. 11 ref.

1138* X-Ray Analysis of Carbides in Molybdenum Steel. (Swedish.) Kehsin Kuo. *Jernkontorets Annaler*, v. 137, no. 5, 1953, p. 141-148.

Reports discovery of new Fe-Mo double carbide in steels of 1 to 5% Mo. Carbide reactions and phases in equilibrium at 700 C. were studied. Tables, diagrams. 17 ref.

1139* X-Ray and Chemical Analysis of Carbides in Chromium Steel. (Swedish.) Kehsin Kuo. *Jernkontorets Annaler*, v. 137, no. 5, 1953, p. 149-156.

Presents equilibrium diagram for the Fe-Cr-C system below A_1. Reports presence of αFe, Fe_3C, Cr_7C_3, and $Cr_{23}C_6$. Carbide reactions are explained. Graphs, tables. 21 ref.

1140 An Introduction to the Electron Theory of Metals. Robert A. Lefever. *Journal of Chemical Education*, v. 30, Oct. 1953, p. 486-490.

Provides general background for understanding metal physics as well as a basis for more advanced study. Diagrams. 14 ref.

1141 System Ag_2O-B_2O_3; Its Thermodynamic Properties as Slag Model. G. M. Willis and F. L. Hennessy. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1367-1373.

Discusses measurement of O_2 pressure in equilibrium with Ag and Ag_2O-B_2O_3. Table, graphs. 26 ref.

1142 The Cold Rolled Texture of Titanium. D. N. Williams and D. S. Eppelsheimer. *Journal of Metals*, v. 5; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 197, 1953, p. 1378-1382.

Describes above. Specimens were examined using the Shulz-Decker Geiger counter technique. Tables, diagrams. 8 ref.

1143 Alloying Characteristics of Magnesium. John Alico. *Light Metal Age*, v. 11, Oct. 1953, p. 16-17, 24, 26.

Discusses structure of magnesium crystal lattice as it applies to properties of its alloys. Graph, table.

1144* Gas in Pig and Cast Iron. (Dutch.) J. E. Degraaf. *Metalen*, v. 8, no. 17, Sept. 1953, p. 319-324.

Compares solubility of hydrogen, nitrogen, and oxygen with gas content actually found. Supersaturation was proven to be frequent. Tables, graphs. 20 ref.

1145 Growth of Single Crystals From a Melt. *Metal Industry*, v. 83, Sept. 18, 1953, p. 242.

Discusses the Bridgeman method. Reports influence of temperature gradient and rate of growth on quality of single crystals of Bi, Pb, Sn, and Zn. 2 ref.

1146* Magnetic Measuring in Metallography. (German.) W. Jellinghaus. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 669-678.

Presents survey of ferromagnetic crystal types; application of ferromagnetic methods to studying structures, textures, and deformation processes; paramagnetic and diamagnetic substances; and measuring devices and processes. Graphs, diagrams. 39 ref.

1147* Metallographic Investigations of Electrolytic Chromium Deposits. (German.) L. Koch and G. Hein. *Metalloberfläche*, Ausgabe A, v. 7, no. 10, Oct. 1953, p. 145-148.

Discusses hexagonal β modifications changing to cubic modifications upon heating to room temperature or storing for prolonged periods. Micrographs, tables. 10 ref.

1148 Fractographic Patterns of Segregation. Carl A. Zapffe. *Metallurgia*, v. 48, no. 287, Sept. 1953, p. 130-132.

Describes fractographic patterns in Zn-Al and Bi-Sb alloys. Micrographs. 6 ref.

1149* Recording Methods in Electron Microscopy. (French.) R. Dargent. *Metaux, Corrosion-Industries*, v. 28, nos. 335-336, July-Aug. 1953, p. 285-292.

Reviews various methods. Discusses method yielding a double record. Micrographs. 12 ref.

1150* Polygonized State of a Metals. (French.) A. Guinier. *Metaux, Corrosion-Industries*, v. 28, no. 337, Sept. 1953, p. 339-347.

Explains polygonization as a metastable state preceding recrystallization. Diagrams, micrographs. 14 ref.

1151* Structure of the Zirconium-Silicon System. (German.) H. Schachner, H. Nowotny, and R. Machenschalk. *Monatshefte für Chemie*, v. 84, no. 4, 1953, p. 677-685.

X-ray studies revealed presence of $ZrSi_2$, ZrSi, Zr_5Si_3, and Zr_2Si. Tables. 14 ref.

1152 X-Ray Investigations of The Platinum-Mercury System. (German.) E. Bauer, H. Nowotny, and A. Stempfl. *Monatshefte für Chemie*, v. 84, no. 4, 1953, p. 682-700.

Phases were radiographically investigated over entire concentration range. Tables. 10 ref.

1153* Crystal Structure of Mn_2Ge_3 and Several Ternary Phases with Two Transition Elements. (German.) L. Castelliz. *Monatshefte für Chemie*, v. 84, no. 4, 1953, p. 765-776.

Discusses results of X-ray studies of various binary and ternary alloys of Ge, Sn, and Sb. Tables. 9 ref.

1154* Interface Area, Edge Length, and Number of Vertices In Crystal Aggregates With Random Nucleation. J. L. Meijering. *Philips Research Reports*, v. 8, Aug. 1953, p. 270-290.

Describes vertices in "cell model" and "Johnson-Mehl" model. Tables, graphs, diagrams. 10 ref.

1155 A Comparison of the Powder Patterns on a Sample of Grain-Orientated Silicon-Iron With Those Obtained on a Single Crystal. L. F. Bates and A. Hart. *Physical Society, Proceedings*, v. 66, no. 405A, Sept. 1953, p. 813-818.

Describes new pattern, gives conditions for appearance, and data on domain boundary spacings. Diagram, graph. 4 ref.

1156 A Study of Bitter Figures on the (110) Plane of a Single Crystal of Nickel. L. F. Bates and G. W. Wilson. *Physical Society, Proceedings*, v. 66, no. 405A, Sept. 1953, p. 819-822.

Describes magnetic domain structure of a single crystal of Ni cut so that 2 easy directions of magnetization lay in the plane of each main surface. Diagram, graph. 6 ref.

1157 A Proposed Structure for Certain Domain Configurations on a Single Crystal of Nickel. G. W. Wilson. *Physical Society, Proceedings*, v. 66, no. 405A, Sept. 1953, p. 840-841.

Includes diagram. 3 ref.

1158 Metallographic Examination of Hot Metal Surfaces. B. W. Mott and S. D. Ford. *Research*, v. 6, Oct. 1953, p. 396-400.

Describes apparatus for microscopic examination of easily oxidized, refractory metals at temperatures up to 1000 C. Diagram, photograph. 12 ref.

1159* Anomalies Observed in Recrystallization of Sheets and Tubes of Copper Alloys Containing Aluminum. (French.) J. Marechal and M. Doucet. *Revue de metallurgie*, v. 50, no. 8, Aug. 1953, p. 537-550.

Discusses reduction in grain size between 400 and 600 C. Graphs, micrographs.

1160* Thermoelastic Study and Isothermal Decomposition of Eutectoid in Aluminum Bronzes. (French.) Rene Le Roux. *Revue de metallurgie*, v. 50, no. 8, Aug. 1953, p. 558-578.

Follows pearlitic, martensitic and order-disorder transformations by measurements of variations in elastic modulus during continuous cooling. Tables, graphs, micrographs, diagrams. 31 ref.

1161* Method and Examples of Applications of X-Ray Tensile Testing. (German.) A. Schaal. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 7, July 1953, 1953, p. 211-217.

Discusses fundamentals of stress measurement by X-ray diffraction. Indicates uses for methods described. Photographs, graphs, tables, diagram. 7 ref.

33. *Metals—Metallography, Transformations, and Structures*

1162 Color Shows Up the Unknown in Metallography. J. H. Powers and W. J. Loach. *Steel*, v. 133, Oct. 15, 1953, p. 93-96.

Discusses heat tinting as key to color examination of carbide mixtures; reports each constituent and phase can be identified; and shows new methods for studying structure-property relationship. Photographs.

1163 Can I Benefit From the Use of Low Temperature Treatment? Howard E. Boyer. *Steel Processing*, v. 34, Oct. 1953, p. 502-508.

Discusses low-temperature austenite transformations in steels. Tables, graphs, photographs.

1164* Recrystallization Textures of Titanium. (German.) D. N. Williams and D. S. Eppelsheimer. *Zeitschrift für Metallkunde*, v. 44, no. 8, Aug. 1953, p. 360-362.

Reports textures resulting from heating pure cold-rolled Ti to 800 C and commercial cold-rolled Ti to 650, 800, and 880 C. Diagrams, tables. 6 ref.

1165* Nature and Properties of Grain Boundaries of Polycrystalline Metallic Substances. (German.) Kurt Lücke. *Zeitschrift für Metallkunde*, v. 44, no. 8, Aug. 1953, p. 370-378.

Discusses plasticity and anelasticity. Presents experimental study of grain-boundary energy. Photographs, graphs, diagrams, tables. 42 ref.

1166* Recognition of Nickel-Carbon-Magnesium System. (German.) Erich Echeil and Leo Hütter. *Zeitschrift für Metallkunde*, v. 44, no. 8, Aug. 1953, p. 387-389.

Describes system as ternary carbide of cubically face-centered lattice. Discusses occurence of quadruple-phase equilibria. Graphs, micrographs.

1167* The Decomposition of the Hexagonal Aluminum Boride AlB_2. (German.) Franz Lihl and Peter Jenitschek. *Zeitschrift für Metallkunde*, v. 44, no. 9, Sept. 1953, p. 414-417.

Describes method of preparing Al-B alloys, metallographic study of Al-B alloys with AlB_3 inclusions, and X-ray study of AlB_2 decomposition and its effect on the alloys. Micrographs. 7 ref.

1168* Nature and Properties of the Grain Boundaries of Polycrystalline Metals. Reviews of Recent Work. (German.) Kurt Lücke. *Zeitschrift für Metallkunde*, v. 44, no. 9, Sept. 1953, p. 418-426.

Discusses general theory of grain boundaries, grain boundary diffusion, and some structural pecularities caused by surface energy. Diagrams, graphs, micrographs. 23 ref.

1169* Thermodynamics of the Transfer Processes in Ionic Mixtures and Their Application on Isotope-Containing Salts and Metals. (German.) Alfred Klemm. *Zeitschrift für Naturforschung*, v. 8a, no. 7, July 1953, p. 397-400.

Discusses relationship between conductivity, cationic and anionic self diffusion, and the mass effect of electrolytic migration. 4 ref.

1170* Self-Diffusion of Thallium in Molten Thallium Chloride. (German.) E. Berne and A. Klemm. *Zeitschrift für Naturforschung*, v. 8a, no. 7, July 1953, p. 400-403.

Discusses experimental method of measuring self-diffusion coefficients. Diagram, table, graph.

1171* Electron Diffraction on Metal Monocrystals up to 1000C. (German.) Chr. Menzel-Kopp and E. Menzel. *Zeitschrift für Naturforschung*, v. 8a, no. 8, Aug. 1953, p. 499-501.

Describe research arrangement which permits rapid sequence of heating and observation intervals. 11 ref.

1172* A Macrostructure of Amorphous Selenium. (German.) Joachim Weber. *Zeitschrift für Naturforschung*, v. 8a, no. 9, Sept. 1953, p. 565-566.

Describes conditions under which crystalline structures were induced. Diagram, photographs.

Books and Miscellaneous Publications

1173 Alphabetical and Grouped Numerical Index of X-Ray Diffraction Data. 441 p. 1950. American Society for Testing Materials, Philadelphia. (QC481 Am35a)

See also:

294 (microstructure of enameled iron)
415 (structural phenomena during polarization of metals)
906 (transformation kinetics of Ti-Al-Cr alloys)
907 (transformation kinetics of Ti-Al-Cr alloys)
915 (X-ray studies in austenitic Cr-Ni steels)
911 (X-ray studies in austenitic Cr-Ni steels)
943 (microstructure of lamelar-graphite cast iron)
951 (transformations in Fe-Ni and Fe-Ni-C alloys)

34. METALS—POWDER

1174* Development of Aluminum Powder Metallurgy. (Hungarian.) György Halmos. *Aluminium (Budapest)*, v. 5, no. 6, June 1953, p. 130-133; no. 7, July 1953, p. 159-162.

Describes experiments with Al alloy, Al-Cu bimetallic, Al-metalloid, and Al sintered bodies. Describes machinery used and strength values achieved. Tables, charts, diagrams, photographs. (To be continued.)

1175* The Sintering Process. I. Theory. Philip R. Kalischer. *Precision Metal Molding*, v. 11, Oct. 1953, p. 58-59, 109-115.

Discusses possible mechanisms involved. Diagrams. (To be continued.)

1176 Effective Thermal Conductivities of Magnesium Oxide, Stainless Steel, and Uranium Oxide Powders in Various Gases. C. S. Eian and R. G. Deissler. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53G03, Oct. 29, 1953, 18 p. (TL782 Un3rm)

Tests were conducted at temperatures bteween 120 and 1455 F. Fair agreement was obtained between conductivities calculated from experimental data and those calculated from a simplified analysis. Effect of gas pressure on effective thermal conductivity was determined. Graphs, micrographs.

1177* Production of Alloys by Impregnation. (German.) Heinz Anders. *Werkstoffe und Korrosion*, v. 4, nos 8-9, Aug. Sept. 1953, p. 308-309.

Reports progress in powder metallurgy in Germany and abroad. 3 ref.

35. MINING ENGINEERING

1178* Blasthole Drilling at Inco Mines. F. F. Todd, J. H. Dewey, and E. C. Hodgson. *Canadian Mining and Metallurgical Bulletin*, v. 46, no. 498, Oct. 1953, p. 622-633; *Canadian Institute of Mining and Metallurgy, Transactions*, v. 56, 1953, p. 332-343.

Discuss percussion drills with carbide bits, diamond drilling, BX drilling, and trends in diamond and percussion drilling. Photographs, graphs, diagrams, tables.

1179 Keeping Safety Up-to-Date. W. H. Bennett. *Coal Age*, v. 58, Oct. 1953, p. 98-101.

Gives practical pointers on how to gear safety procedures and training to modern operating conditions in mines.

1180 Gulf Coast Deep Drilling. What It Takes to Drill Those 15,000-ft. Holes. William P. Sterne. *Oil and Gas Journal*, v. 52, Oct. 5, 1953, p. 254, 256, 259.

Gives engineering details on 5 wells. Table.

1181 Pressure Maintenance Increasing Oil Recovery by Millions of Barrels. *Oil and Gas Journal*, v. 52, Nov. 2, 1953, p. 105-107.

Relates experiences with the above at several Texas sites. Graphs.

1182 Annual Report of Research and Technologic Work on Coal and Related Investigations. Fiscal year 1952. R. L. Brown and W. H. Ode. *U. S. Bureau of Mines, Information Circular* 7663, 1953, 67 p. (TN21 Un3i)

Covers research on mining, preparation, and utilization of coal. Photographs, graphs, diagrams. 37 ref.

1183* Completion Time Cut by Drilling Progress. A. W. Thompson. *World Oil*, v. 137, Oct. 1953, p. 163-164, 167-168, 170, 172, 174.

Discusses recent improvements in methods of drilling oil wells. Delineates problems for future study. Graph. 3 ref.

36. NON-DESTRUCTIVE TESTING

1184* Principles and Methods of Nondestructive Testing with Ultrasound Waves. (German.) A. Lutsch. *Archiv für technisches Messen*, 1953, no. 212, Sept., p. 209-210.

16 ref.

1185* Testing With Energy Radiation. Testing With X-, Gamma-, and Beta-Rays. (German.) R. Berthold. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 123-126.

Describes methods of testing for casting defects, corrosion, bearing wear, volume of sealed containers, furnace linings, wall thickness, and densities. Graphs.

1186* Synthetic Radioactive Isotopes in Nondestructive Materials Testing. (German.) E. A. Müller. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 126-130.

Discusses preparation, economy, and effect of intensity and conditions on test results. Diagrams, photographs.

1187* Philips Measuring Devices for Nondestructive Materials Testing. (German.) E. Schlosser. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 130-135.

Describes Philips Geiger-Muller counter, d.c. X-ray equipment, single-tank X-ray apparatus, extensometers, directly recording measuring bridge, and roughness meter. Photographs.

1188* Magnetic and Electrical Methods of Nondestructive Testing. (German.) Werner Jellinghaus. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 168-174.

Describes methods of investigating properties, locating defects, and making thickness measurements. Diagrams, graphs. 29 ref.

1189* Electronic Instruments for Nondestructive Materials Testing. (German.) H. Breitfeld. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 175-178.

Describes the "Forster", "Magnatest Q", "Multitest", and "Sigmatest" instruments.

1190* Magnetic Powder Testing. (German.) E. A. W. Müller. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben*, v. 98, nos. 7-8, July-Aug. 1953, p. 178-180.

Describes different procedures for detecting defects. Photographs, diagrams.

1191 Wire Testing by Ultrasonic Methods. R. Pohlman. *Engineers' Digest*, v. 14, Oct. 1953, p. 393-394.

Translated from *Draht*, v. 4, no. 6, June 1953, p. 211-214.
Describes testing of small or thin sections by the "transmitted pulse" method. Diagrams.

1192 Ultrasonic Testing of Castings. Thomas A. Dickinson. *Foundry*, v. 81, Sept. 1953, p. 221-222, 224, 226.

Describes an "Immersion" testing technique which detects internal flaws in all but the most porous types of castings. Diagram.

1193* Nondestructive Testing of Large Castings. (German.) *Giesserei*, v. 40, no. 20, Oct. 1953, p. 543-547.

Discusses the oil-lime, magnetic-powder, and stress-gage processes. Describes water-pressure, X-ray, and ultrasound test methods. Photographs, graphs.

1194* Non-destructive Gamma Radiography for Diamond Tools. *Industrial Diamond Review*, v. 13, Sept. 1953, p. 210-212.

Gives technique for testing the setting of diamond tools. Photographs, table. 10 ref.

1195* "Immersion" Increases Efficiency of Ultrasonic Weld Inspection. John Starr. *Industry Welding*, v. 26, Oct. 1953, p. 64-66, 68, 71.

Shows how most objectionable features are eliminated from older units. Photographs, diagrams.

1196 Conductivity. Now a Useful Nondestructive Testing Tool. Henry N. Staats. *Materials & Methods*, v. 38, Oct. 1953, p. 124-126.

Describes instrument, developed in Germany, which directly measures electrical conductivity of materials. It can be used for sorting nonferrous metals and alloys, identifying unknown metals, evaluating hardness, and checking heat treating results. Photographs, charts.

1197* Radiographic Examination of Welds. A Complete Assessment of Defects in Terms of Tensile and Fatigue Strength. (Italian.) Oscar Masi and Antonio Erra. *Metallurgia italiana*, v. 45, no. 8, Aug. 1953, p. 273-283.

Tables, diagrams, graphs, photographs. 7 ref.

1198* Ultrasonic Testing of Weld Seams. (German.) Hans Krächter, S. Krautkrämer, and H. Krautkrämer. *Schweissen und Schneiden*, v. 5, no. 8, Aug. 1953, p. 305-314.

Discusses ultrasonic and X-ray techniques. Photographs, diagrams, tables, graph.

37. NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION

1199* Some Facts Concerning Radiation Biology. W. Summer. *Atomics (British)*, v. 4, Oct. 1953, p. 258-262.

Discusses some effects of radioactive radiation upon human body. Tables. 2 ref.

1200* On the Method of Maesuring the Radioactivity of P^{32} Isotope. (Russian.) A. A. Smirnov. *Biokhimiia*, v. 18, no. 2, Mar-Apr. 1953, p. 223-226.

Discusses advantages of using glass plates for carrying out experiments with radioactive P. Tables, photograph. 3 ref.

1201 Recent Advances in Nuclear Physics. John Cockcroft. *British Journal of Applied Physics*, v. 4, Oct. 1953, p. 289-297.

Discusses synchro-cyclotrons built since the war which are enabling studies to be made on interaction of high-speed nucleons with nuclear matter and on interaction of individual nucleons. Table, diagrams, photographs, graphs. 20 ref.

1202* Atomic Energy as Fuel. (Japanese.) Naoto Kameyama. *Fuel Society of Japan, Journal*, v. 32, no. 312, Apr. 1953, p. 222-228.

Based on observation of the French atomic pile, electrical power costs were computed for the non-regenerative, regenerative, and breeder processes. 2 ref.

1203 Attenuation of Gamma Rays. I. Transmission Values for Finite Slabs of Lead, Iron, and the Compton Scatterer. Glenn H. Peebles, *Journal of Applied Physics*, v. 24, Oct. 1953, p. 1272-1287.

Discusses "build-up" factor for a monoenergetic, monoangular beam of photons incident on a slab of finite thickness but infinite extent. Graphs, tables, diagram. 9 ref.

1204* Can Matter Be Created Out of Cosmic Radiation. (English.) A. K. Das. *Naturwissenschaften*, v. 40, no. 16, 1953, p. 433-434.

Presents theoretical discussion. 5 ref.

1205 Cerenkov Radiation from a Co^{60} Source in Water. J. A. Rich, R. E. Slovacek, and E. J. Studer. *Optical Society of America, Journal*, v. 43, Sept. 1953, p. 750-752.

Spectral distribution in the range 3200 to 6000A was obtained. Results were in agreement with the predictions of the Frank and Tamm theory. Diagrams, graphs. 4 ref.

1206 The 15 Million Electron-Volt Linear Electron Accelerator for Harwell. C. F. Bareford and M. G. Kelliher. *Philips Technical Review*, v. 15, July 1953, p. 1-26.

Discusses choice of parameters and general design. Describes

37. *Nuclear Physics, Nucleonics and Radiation*

main components and circuits, testing, and performance. Photographs, diagrams, graphs. 19 ref.

1207* Silver Bromide Emulsions for Measurements in Atomic Physics. (German.) Klotzer. *Photo-Technik und-Wirtschaft*, v. 4, no. 7, July 1953, p. 255.

Describes use for detecting and measuring radioactive rays.

1208* Nuclear Magnetic Resonance Experiments on $CuCl_2 \cdot 2H_2O$, $K_2CuCl_4 \cdot 2H_2O$ and $(NH_4)_2CuCl_4 \cdot 2H_2O$. J. Itoh, R. Kusaka, Y. Yamagata, R. Kiriyama, and H. Ibamoto. *Physica*, v. 19, no. 5, May 1953, p. 415-418.

Discusses above. Graphs. 5 ref.

1209 Gamma Radiation Emitted by Oriented Nuclei. The Influence of Preceding Radiations; The Evaluation of Experimental Data. J. A. M. Cox and H. A. Tolhoek. *Physica*, v. 19, no. 18, Aug. 1953, p. 673-682.

Discusses multipole character of γ-transitions and nuclear spins, parities, and magnetic moments. 14 ref.

1210 The Principle of Nuclear Induction. Felix Bloch. *Science*, v. 118, Oct. 16, 1953, p. 425-430.

17 ref.

1211 Research in Nuclear Magnetism. E. M. Purcell. *Science*, v. 118, Oct. 16, 1953, p. 431-436.

17 ref.

1212 Scintillation Counters. George B. Collins. *Scientific American*, v. 189, Nov. 1953, p. 36-42.

Describes device which amplifies flash emitted by certain substances when struck by a ray or particle. Reports instrument highly versatile and important to progress of physics. Photographs, diagrams.

1213* Shall We Produce Atomic Energy Directly From Natural Uranium? (Norwegian.) H. V. Ubisch. *Teknisk Ukeblad*, v. 100, no. 37, Oct. 8, 1953, p. 787-791.

Discusses prospects of using atomic energy for peaceful purposes. Tables. 6 ref.

1214* Modern Quantity-Measuring Device for X-Ray and Electronic Radiation. (German.) H. Simon. *Umschau in Wissenschaft und Technik*, v. 53, no. 17, Sept. 1, 1953, p. 528-529.

Describes use of vacuum-CdS crystal cells for measurement. Photographs, diagrams. 7 ref.

Books and Miscellaneous Publications

1215 Experimental Nuclear Physics. v. I. E. Segre, editor. 789 p. 1953. John Wiley & Sons, N. Y. (QS173 Se38e)

Includes "Detection Methods", Hans H. Staub; "Passage of Radiation Through Matter", Hans A. Bethe and Julius Ashkin; "Nuclear Moments and Statistics", Norman F. Ramsey; "Nuclear Two-Body Problems and Elements of Nuclear Structure", Norman F. Ramsey; and "Charged Particle Dynamics and Optics, Relative Isotopic Abundances of the Elements, Atomic Masses", K. T. Bainbridge.

1216 Experimental Nuclear Physics. v. II. E. Segre, editor. 600 p. 1953. John Wiley & Sons, N. Y. (QC173 Se38e)

Includes "A Survey of Nuclear Reactions", Philip Morrison; and "The Neutron", Bernard T. Feld.

See also:

37 (tracers in agricultural chemistry)
72 (nuclear reactor materials)
546 (economics of atomic power)
600 (food sterilization by ionizing radiation)

38. OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING

1217 Planning a System for Materials Handling. Kennard F. Lange. *American Foundryman*, v. 24, Nov. 1953, p. 42-47.

Describes equipment, plant layout, and operating procedures including handling of raw materials, use of elevator for coke, charging of cupola, selection of core oven, and cooling methods for castings. Photographs, diagrams.

1218 The New Patent Law. Robert Calvert. *Chemical and Engineering News*, v. 31, Oct. 12, 1953, p. 4186-4188.

Describes details and simplifications in new law. 38 ref.

1219* Operations Research. Morley G. Melden. *Factory Management and Maintenance*, v. 111, Oct. 1953, p. 113-120, 238, 240, 242, 244.

Describes use, tools, and possibilities of operations research.

1220 Analysis Method Helps Management Solve Personnel Problems. W. B. Olson. *Iron Age*, v. 172, Oct. 15, 1953, p. 114-117.

Describes simple analysis method which is giving management more of the answers it needs in problems involving personnel. Tables, charts.

39. PHYSICS

1221 Gamma-Ray Spectroscopy. S. C. Curran. *Advances in Physics*, v. 2, Oct. 1953, p. 411-449.

Examines available experimental techniques, indicating advantages and limitations of various methods. Considers both high and low resolution instruments. Diagrams, graphs, tables. 79 ref.

1222 The Motion of a Conducting Sphere in a Uniform Magnetic Field. D. J. Besdin, J. R. Shewell, and Ernst Ikenberry. *American Journal of Physics*, v. 21, no. 6, Sept. 1953, p. 418-421.

Discusses torque and angular velocity, motion of center of mass, and motion of axes fixed in the sphere. 4 ref.

1223* The Under-Water Spark as a Source of Sonic Frequencies. (German.) Helmut Drubba and Hans Heinrich Rust. *Archiv der elektrischen Übertragung*, v. 7, no. 9, Sept. 1953, p. 429-440.

Describes experimental device and procedure. Photographs, diagrams, graphs. 138 ref.

1224* Magnetic Properties of Certain Bisulfides. (French.) Louis Neel and Rene Benoit. *Comptes rendus*, v. 237, no. 7, Aug. 17, 1953, p. 444-447.

Magnetic phenomena of MnS_2, FeS_2, CoS_2, and NiS_2 were studied. Table, graphs.

1225 Studies on the Concept of Large Activator Centers in Crystal Phosphors. I. Dependence of Luminescent Efficiency on Concentration of Activator, Size of Luminescent Centers. II. Effects of Concentration of Activator, of Temperature, and of Flux on the Excitation and Emission of CaO:Bi Phosphors. III. Preparation and Properties of Calcium Oxide Phosphors With Eleven Different Activators. J. Ewles and N. Lee. *Electrochemical Society, Journal*, v. 100, Sept. 1953, p. 392-407.

Includes diagrams, graphs, tables. 28 ref.

1226 A Rapid Method for Evaluating the Activity of Piezoelectric Barium Titanate. H. I. Oshry and J. Minkowski. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 21-22.

Constant describing the behavior of piezoelectric barium titanate elements are briefly discussed. Relation to elements of an equivalent circuit is given. Method is illustrated by example of piezoelectric barium titanate discs. Diagrams.

1227 A Review of Methods for Measuring the Constants of Piezoelectric Vibrators. Eduard A. Gerber. *I.R.E., Proceedings*, v. 41, Sept. 1953, p. 1103-1112.

Diagrams, tables. 27 ref.

1228 An Interferometer. Jim G. Malik, John L. Speirs, and Max T. Rogers. *Journal of Chemical Education*, v. 30, Sept. 1953, p. 437-441.

Describes a bench-top construction which compares favorably with commercial instruments. It will detect refractive index changes in the order of 1×10^{-8}. Photographs, diagrams. 80 ref.

1229 Atomic Structure and the Photoelectric Effect. Clyde P. Brockett. *Journal of Chemical Education*, v. 30, Oct. 1953, p. 498-501.

Describes use of NE-34 cold cathode gas diode as a phototube to demonstrate photoelectric emission and gaseous ionization. Diagrams. 48 ref.

1230 Precision Measurement of Wavelengths with Echelle Spectrographs. George R. Harrison, Sumner P. Davis, and Hugh J. Robertson. *Optical Society of America, Journal*, v. 43, Oct. 1953, p. 853-861.

Describes equipment and techniques. Discusses possible accuracy of method. Diagrams, graphs. 15 ref.

1231* The Temperature Dependence of the Spontaneous Magnetization in an Antiferromagnetic Single Crystal. (English.) N. J. Poulis and G. E. G. Hardeman. *Physica*, v. 19, no. 5, May, 1953, p. 391-396.

The time average magnetic moment of the Cu-ions in an antiferromagnetic single crystal of $CuCl_2 \cdot 2H_2O$ was measured using the nuclear magnetic resonance method. Graphs. 5 ref.

1232* Magnetic Resonance in $LaMuO_3$ at Low Temperature. (English.) Tosihiko Okamura and Yuzo Kojima. *Physica*, v. 19, no. 5, May 1953, p. 412-414.

Discusses magnetic resonance in $LaMnO_3$ from room temperature down to the temperature of liquid N at microwave frequencies of 23500 Mc. and 9450 Mc. Table, graph. 7 ref.

1233* Thermal Tests of Absorption of Ultrasonic Waves in Liquids. (German.) S. Parthasarathy, D. Srinivasan, and S. S. Chari. *Zeitschrift für Physik*, v. 135, no. 4, July 1953, p. 395-402.

Reports determination of heat quantity evolved by ultrasonics in several organic liquids. Graphs, tables. 10 ref.

1234* Relationship of Temperature Effect Produced by Ultrasonic Waves in Liquids to Its Absorption Coefficient. (German.) S. Parthasarathy, D. Srinivasan, and S. S. Chari. *Zeitschrift für Physik*, v. 135, no. 4, 1953, p. 403-405.

Describes determination of heat quantity evolved by ultrasonics in organic liquids, with regard to corrections at 5 and 15 Mc. At low frequencies, heat quantity was proportional to absorption coefficient. At higher temperatures, it was not proportional. Tables.

Books and Miscellaneous Publications

1235 Stochastic Processes. J. L. Doob. 654 p. 1953. John Wiley & Sons, N. Y. (QA273 D72a)

A detailed treatment of stochastic processes and their mathematical background.

1236 Numerical Solution of Differential Equations. William Edmund Milne. 275 p. 1953. John Wiley & Sons, New York. (QA371 M63n)

Attempts to acquaint the reader with some of the principal techniques available for the numerical solution of ordinary and partial differential equations.

1237 Technical Aspects of Sound. v. I. Sonic Range and Airborne Sound. E. G. Richardson. 544 p. 1953. Elsevier Press, Amsterdam. (QC225 R39t)

Includes sections on acoustic measurements and materials; acoustics of buildings; noise; speech and hearing; sound reproduction; analysis and synthesis of sound; and design and performance of musical instruments.

1238 Reports on Progress in Physics. v. XV. A. C. Strickland, editor. 338 p. 1952. Physical Society, London S. W. 7. (Qc3 P56r)

Includes "The Hydrogen Bond", L. Kellner; "Mass Spectrometry", K. I. Mayne; "Range Energy Relations", A. E. Taylor; "The Analysis of High Energy Neutron-Proton and Proton-Proton Scattering Data", R. S. Christian; "Turbulent Motion", G. K. Batchelor; "Ferrites", A. Fairweather, F. F. Roberts, A. J. E. Welch; "The Band Structure of Metals", G. V. Raynor; "Galvanomagnetic Effects in Conductors", D. K. C. Mac Donald and K. Sargison; and "Traveling Wave Tubes", R. Kompfner.

1239 Reports on Progress in Physics. v. XVI. A. C. Strickland, editor. 407 p. 1953. Physical Society, London. (QC3 P56r)

Includes "Neutron Diffraction", G. E. Bacon and K. Lonsdale; "Physical Properties and Atomic Arrangements in Crystals", W. A. Wooster; "Raman Effect in Solids", A. C. Menzies; "Paramagnetic Resonance", B. Bleaney and K. W. H. Stevens; "Semiconductor Circuit Elements", J. S. Blakemore, A. E. DeBarr, and J. B. Gunn; "Electrical Discharges," F. Llewellyn Jones; "Fluctuation Theary in Physical Measurements", C. W. McCombie; "Cosmology", W. H. McCrea; and "The New Unstable Cosmic-Ray Particles", G. D. Rochester and C. C. Butler.

1240 Introduction to the Theory of Functions of a Complex Variable. Wolfgang J. Thron. 230 p. 1953. John Wiley & Sons, N. Y. (QH331 T41i)

40. PLASTICS

1241 Recent Developments in Ethoxyline Resins. J. B. D. MacKenzie. *Adhesives & Resins*, v. 1, Sept. 1953, p. 179-185.

Describes some newer types and their applications. Photographs, graphs, tables.

1242 Copolymerization Characteristics and Spectra of Phenyl Vinyl Sulfide and Sulfone. Charles C. Price and Hirokazu Morita. *American Chemical Society, Journal*, v. 75, Oct. 5, 1953, p. 4747-4750.

Includes tables. 13 ref.

1243 Configuration of Polybutadienes Prepared at High Temperatures. A. I. Medalia and Harold H. Freedman. *American Chemical Society, Journal*, v. 75, Oct. 5, 1953, p. 4790-4793.

Includes tables, graphs.

1244* A Constant Stiffness Tester for Thin Plastic Films. F. D. Dexter. *ASTM Bulletin*, 1953, no. 192, p. 40-43.

Gives design and operation of apparatus. Diagrams, tables, graph.

1245 Blow-Moulding of Polythene Bottles. *British Plastics*, v. 26, Oct. 1953, p. 357-360.

Describes process easily adaptable to mass production. Photographs, diagrams.

1246 The Vinyl Type Polymers. Calvin E. Schildknecht. *Chemical and Engineering News*, v. 31, Nov. 2, 1953, p. 4516-4520.

Presents survey of recent applications of the many vinyl type materials. Photographs.

1247* Plastics and Chemical Plant. V. Evans. *Chemical & Process Engineering*, v. 34, Oct. 1953, p. 307-311.

Discusses applications of plastics to protective coatings, linings, corrosion-resistant cements, and plant and equipment built largely or entirely of plastics. Photographs. 28 ref.

1248 The Polymerizability of Methyl α-tert.-Butylacrylate. II. J. W. C. Crawford. *Chemical Society, Journal*, 1953, Sept., p. 2658-2661.

Includes graphs.

1249 Motor City Invasion. *Chemical Week*, v. 73, Oct. 17, 1953, p. 38, 40, 42.

Discusses applications of reinforced plastics in automobile bodies.

1250* Combined Influence of the Emulsifier and Initiator on the Rate of Polymerization in an Emulsion. (Russian.) A. I. Iurzhenko and N. S. Tsvetkov. *Doklady Akademii Nauk SSSR*, v. 90, no. 3, May 21, 1953, p. 421-424.

Discusses polymerization of styrol and isoprene and molecular weights of polymers formed. Graphs, table. 5 ref.

1251 Polymerization of Esters of Methacrylic Acid. I. The Polymerization of *n*-Butyl Methacrylate. II. The Polymerization of *n*-Propyl Methacrylate. G. M. Burnett, P. Evans, and H. W. Melville. *Faraday Society, Transactions*, v. 49, Sept. 1953, p. 1096-1107.

Includes tables, graphs. 32 ref.

40. *Plastics*

1252 Multi-Screw Extrusion of Rigid Vinyls. S. H. Greenwood. *India Rubber World*, v. 129, Oct. 1953, p. 73-75.

Describes equipment and operating procedures and emphasizes growing demand for rigid polyvinyl chloride. Photographs.

1253 Physical Properties of Polyethylene Terephthalate Films. Leonard E. Amborski and Donald W. Flierl. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2290-2295.

Describes qualities of the Dacron and Mylar. Products are chemically inert, excellent as dielectric, good barriers to vapors and odors. Graphs, tables. 5 ref.

1254 Structure and Moisture Permeability of Film-Forming Polymers. P. W. Morgan. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2296-2306.

Correlates the above for over 100 polymers. Shows that selective barriers can be made from the proper polymer or laminate. Graphs, tables. 45 ref.

1255 Polymerization in Melamine-Formaldehyde Molded Resins. H. P. Wohnsiedler. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2307-2311.

Determines most likely structures for cured resins based on degree of polymerization before molding and analysis of molded resins. Graph, table, diagrams. 16 ref.

1256 Application of the Steady State Method to Benzoyl Peroxide Initiated Polymerization of Styrene. M. M. Horikx and J. J. Hermans. *Journal of Polymer Science*, v. 11, Oct. 1953, p. 325-352.

Discusses theory, apparatus, procedure, and experimental results. Tables, diagrams, graphs. 46 ref.

1257* Effect of Concentration of the Promoter on the Rate of Emulsion Polymerization of Styrol. (Russian.) A. I. Iurzhenko and N. S. Tsvetkov. *Kolloidnyi Zhurnal*, v. 15, no. 2, Mar.-Apr. 1953, p. 136-144.

Discusses polymerization velocity during increase of promotor concentration. Graphs, tables. 10 ref.

1258* Melting Polyethylene and Other High Polymers. (German.) K. Ueberreiter and H. J. Orthmann. *Kolloid-Zeitschrift*, v. 132, nos. 2-3, Aug.-Sept. 1953, p. 61-75.

Presents theoretical investigation of the anisothermal melting range of a series of macromolecular substances. Graphs, tables. 21 ref.

1259* Processing Thermoplastic Synthetics by Hot-Molding and Welding. (German.) O. Dammer. *Kunststoffe*, v. 43 no. 9, Sept. 1953, p. 330-336.

Discusses characteristics of various resins. Methods of fabrication are described. Diagrams, graphs, photographs.

1260* Thermo-Setting Hardenable Synthetic Resins to Form Large Pressed Parts. (German.) Theodor Henne. *Kunststoffe*, v. 43, no. 9, Sept. 1953, p. 341-345.

Describes technique and discusses economics of the method. Graphs, diagrams.

1261* Progress in Stress Optics. (German.) Ludwig Foppl. *Kunststoffe*, v. 43, no. 9, Sept. 1953, p. 346-349.

Describes optical study of internal stresses in plastics.

1262 Sealers as Engineering Materials. Richard S. Piper. *Machine Design*, v. 25, Oct. 1953, p. 158-169.

Gives compositions, data on selection, and applications in machines. Table, photographs, diagrams.

1263 Data Charts for Plastics. *Machine Design*, v. 25, Oct. 1953, p. 170-176.

Gives comprehensive summary of physical, thermal, electrical, and chemical properties of engineering plastics. Tables.

1264 Teflon Joined by Fusion Bonding. H. G. Henry. *Materials & Methods*, v. 38, Oct. 1953, p. 114-115.

Reports that with the proper combination of temperature, pressure, and time, Teflon can be readily welded. Photographs, graphs.

1265 Polyethylene Shippers. *Modern Packaging*, v. 26, Oct. 1953, p. 133-135.

Describes increasing demand in chemical industry for lightweight containers of inert plastic, in the forms of carboys and drums. Photographs.

1266 Embedding in Acrylics. A. J. Spilner. *Modern Plastics*, v. 31, Nov. 1953, p. 129-130, 132-134, 136.

Discusses complete details on process, from preparation of materials to be embedded, to machining finished casting. Photographs. 12 ref.

1267 Effect of Strains on Heat Distortion. J. A. Melchore and H. F. Mark. *Modern Plastics*, v. 31, Nov. 1953, p. 141-142, 144, 146, 148, 211.

Reports results of study undertaken to determine how molding strains influence rate of distortion of thermoplastic test specimen during heat resistance testing. Diagram, tables, graphs. 6 ref.

1268 The Effect of Temperature on the Mechanical Properties and the Friction of Plastics. R. F. King and D. Tabor. *Physical Society, Proceedings*, v. 66, no. 405B, Sept. 1953, p. 728-736.

Describes study of shear strength, indentation hardness or yield pressure, and coefficient of friction of polythene, "P.T.F.F., "Kel-F", and "Perspex" from −100 C up to +80 C. Diagrams, graphs, tables. 9 ref.

1269* Reinforced Plastics. (Dutch.) W. H. Brinkman. *Plastica*, v. 6e, no. 10, Oct. 1953, p. 436-440.

Discusses polyester glass fiber materials. Describes preparation of polyester resins, treatment of glass fiber for better adhesion, properties of laminates, molding methods, and different applications. Photographs.

1270* Polymer Studies. (French.) G. Vallet. *Revue generale du caoutchouc*, v. 30, no. 7, July 1953, p. 460-462.

Discusses composition and structure determination of high polymers. Photographs. 11 ref.

1271* Infra-Red Welding of Plastics. (German.) *Schweisstechnik*, v. 7, nos. 7-8, July-Aug. 1953, p. 93-94.

Discusses new equipment for welding polyethylene foils.

1272* Stability of Plastics Under Protracted Loading. (German.) G. O. Grimm. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 7, July 1953, p. 217-224.

Photographs, graphs, tables.

1273* Outside and Inside Threads on Injection Molded Parts. (Swedish.) H. Spies. *Svenska Plast Foreningen Tekniska Meddelanden*, v. 8, no. 25, July 1953, 5 p. (TP986 Sv25t)

Translated from *Plastverarbeiter*, v. 4, no. 1, Jan. 1953, p. 8. Discusses design of injection molds. Diagrams.

1274* Aids in Costing Injection-Molded Parts. (Swedish.) H. Spies. *Svenska Plast Foreningen Tekniska Meddelanden*, v. 8, no. 27, July 1953, 2 p. (TP986 Sv25t)

Translated from *Plastverarbeiter*, v. 4, no. 3, Mar. 1953, p. 66. Discusses facts to be considered in computing costs. Graphs.

1275* Stress-Optical Investigation of Elastoplastic Stress States. (German.) R. Hiltscher. *V.D.I. Zeitschrift des Vereines deutscher Ingenienure*, v. 95, no. 23, Aug. 11, 1953, p. 777-781.

Proposes the application of new stress-optical effect for plotting calibration curves for the dependence of isochromatic order upon stress in elastoplastic materials such as polystyrol. Photographs. 5 ref.

1276* Conversion of Polybutylmethacrylate Into a Three-Dimensional Polymer. (Russian.) A. Ia. Drinberg, and A. D. Iakovlev. *Zhurnal Prikladnoi Khimii*, v. 26, no. 5, May 1953, p. 532-537.

Discusses process of destruction of macromolecules and their cross-linking during thermal action of atmosphere on polymers of normal butylmetacrylate. Tables, graphs. 4 ref.

See also:

76 (test on plastic dinnerware)
599 (plastics for food packaging)
784 (plastics in rockets, missiles, and nuclear reactors)
1297 (rubber/rosin blends)

41. POLLUTION AND WASTES

1277* Combating the Health Hazard of Dust. Ivor B. N. Evans. *Australasian Engineer*, 1953, Aug. 7, p. 135, 137-138.
Describes spectrographic monitor to protect workers. Photograph.

1278* Dust as Raw Material and as Source of Loss and Gain. (German.) Leo Dietrich. *Chemie-Ingenieur-Technik*, v. 25, nos. 8-9, Aug.-Sept. 1953, p. 433-437.
Discusses losses caused by waste gases and waste waters carrying off dust. Diagrams.

1279 Selecting Equipment For Industrial Dust Control. W. O. Vedder. *Consulting Engineer*, v. 2, Oct. 1953, p. 46-51.
Describes various types of installations for reduction of air pollution and advantages of such systems. Photographs, diagrams, table. 3 ref.

1280 Application of External Dust Control to a Standard 24-in. Pedestal Grinder. I. Dust Control System. W. H. White. **II. Dust Observations and Determinations.** W. B. Lawrie. *Foundry Trade Journal*, v. 95, Oct. 15, 1953, p. 481-487.
Describes work which led to the above including observations of the loci of dust clouds. Gives series of dust counts as indication of efficiency of system. Photographs, diagrams, tables. 2 ref.

1281 Design Factors in Catalytic Fume Elimination. R. J. Ruff. *Heating and Ventilating*, v. 50, Sept. 1953, p. 84-86.
Describes complete combustion process to prevent pollution. Photographs.

1282 Ozone Formation in Photochemical Oxidation of Organic Substances. A. J. Haagen-Smit, C. E. Bradley, and M. M. Fox. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 2086-2089.
Describes formation of O_3 in Los Angeles smogs. Discusses effects on humans, plants, and rubber. Tables. 6 ref.

1283 Atmospheric Pollution. Louis C. McCabe. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 109A-110A.
Tabulates techniques for determination of common pollutants.

1284 Atmospheric Pollution. Louis C. McCabe. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 111A-113A.
A method based on oxidation of phenolphthalein provides a means for estimating oxidant in the air. Graphs. 5 ref.

1285 Smokeless Burning of Waste Process Gases. I. Robert D. Reed. *Industrial Heating*, v. 20, Sept. 1953, p. 1711-1712, 1714, 1716, 1718, 1720.
Means of burning waste process gases with absence of smoke by use of steam injection systems are discussed. Diagram. (To be continued.)

1286 Air Pollution Symposium. *Iron and Steel Engineer*, v. 30, Oct. 1953, p. 91-110.
Includes "Air Pollution Control in Steel Industry", G. A. Howell; "Air Pollution and Remedies", J. J. Seaver; "The Role of Electrical Precipitation in the Steel Industry", H. L. Richardson; "Dust and Fume Problems in the Steel Industry", Richard F. O'Mara; "The Electric Air Cleaner", George F. Landgraf and R. W. McGuire. Diagrams, tables, photographs.

1287* Platinum Recovery During Oxidation of Ammonia. (German.) Hermann Holzmann. *Metall*, v. 7, nos. 17-18, Sept. 1953, p. 684-689.
Gold-plated screens of heat resistant wire were placed in the gas exhaust vent. Up to 90% of the volatilized Pt was retained on the grid. Photographs, tables.

1288* Removal and Separation of Dust in the Metals-Processing Industry. (German.) H. Mürrmann. *Metall*, v. 7, nos. 19-20, Oct. 1953, p. 779-784.
Describes several methods for workshops. Photographs, diagrams.

1289* Here's How the J & L Steel Corp Makes Its Blast-Furnace Gas Yield Rich Iron Ore. W. A. Walton. *Power*, v. 97, Nov. 1953, p. 95-97, 218, 220.
Describes equipment, plant layout, and operating procedures. Photographs.

1290 Stream Pollution. Effect of Kraft Mill Wastes on Stream Bottom Fauna. John N. Wilson. *Sewage and Industrial Wastes*, v. 25, Oct. 1953, p. 1210-1218.
Discusses correlated physical and chemical features. Tables, diagrams. 11 ref.

1291* Smoke Elimination and Fuel Saving in a Brewery. J. Dryden Little. *Smokeless Air*, v. 24, Autumn, 1953, p. 35-42.
Describes overall benefits derived from changing to steam heat and modern combustion equipment. Direct savings will pay for change-over in 9 years. Photographs, diagrams.

Books and Miscellaneous Publications

1292 Study of the Disposal of Chemical Waste at Sea. Alfred C. Redfield and Lionel A. Walford. National Research Council of the National Academy of Sciences, 1951, 49 p. (TD425 R24s)
Includes chapters on "The Sport Fishery of the New York Bight"; "The Behavior of Waste Upon Discharge into the Sea"; "The Biological Effects of Waste Discharge"; "Evidence on the Accumulation of Wastes Following Prolonged Barging Operations"; and "The Circulation of Water in the New York Bight".

42. RUBBER AND ELASTOMERS

1293 Rubber Adhesives. W. H. Swire. *Adhesives & Resins*, v. 1, Sept. 1953, p. 186-188.
Deals with applications in wide variety of industries. (To be continued.)

1294 Neoprene Adhesives. H. J. Lanning. *Adhesives & Resins*, v. 1, Sept. 1953, p. 188-191.
Discusses usefulness and advantages over other rubber adhesives. 5 ref.

1295 The Future of Rubber. John T. Blake. *Chemical and Engineering News*, v. 31, Oct. 1953, p. 4290-4293.
Discusses rising world demand for rubber and synthetics. Reports that, for years to come, only the U. S. and Canada will be equipped to meet the need.

1296* Kowaljow-Studies of Mixing in Rolling Mills. (German.) H. Eichstädt. *Chemische Technik*, v. 5, no. 8, Aug. 1953, p. 478-483.
Presents procedures for mixing rubber. Graphs, tables, diagrams.

1297 Blends of Rubbers and Resins. R. C. Bascom. *Chemistry in Canada*, v. 5, Oct. 1953, p. 220-221.
Describes applications for the above.

1298 Reinforcement of Natural Rubbers by Fillers. John M. Christens. *Indiana Academy of Science, Proceedings*, v. 62, 1952, p. 150-155.
Reports studies of effects of carbon black "Micronex", silica, and coated $CaCO_3$. Graphs. 11 ref.

1299 Manufacture of Latex Articles by Straight Dipping. P. Barber and G. W. van Raamsdonk. *India-Rubber Journal*, v. 125, Oct. 3, 1953, p. 544-546.
Describes use of a heat sensitive latex containing higher than normal NH_3 concentration. Table, photograph. 6 ref.

1300* Compounding of Silicone Rubber. Arbelia C. Glime, Norman A. Duke, and Clinton M. Doede. *India Rubber World*, v. 128, Sept. 1953, p. 766-770, 774.
Describes procedures and treatment of pigments. Micrographs, tables, graphs.

1301* Methods Employed in Compounding Research. X. Ingredients for Compounding Research. I. Drogin. *India Rubber World*, v. 128, Sept. 1953, p. 771-774.
Based on paper presented at Ontario Rubber Section, C.I.C.,

42. *Rubber and Elastomers*

Toronto, Ont., Canada, Mar. 11, 1952. Discusses "Vulcollans", reclaimed rubber, premix, and reclaiming processes. 27 ref. (To be continued.)

1302 Compounding Butyl Rubber for Mineral-Filled Stocks. W. C. Smith. *India Rubber World*, v. 129, Oct. 1953, p. 55-60.

Discusses use of various fillers and their ease of incorporation. Describes special properties such as abrasion resistance, permeability to gases, low-temperature serviceability, and ozone resistance. Graph, tables. 12 ref.

1303 Cleaning Emulsion Polymerization Equipment Fouled by Synthetic Rubber Latex. J. S. Nettleton, M. J. G. Davidson, and H. Leverne Williams. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 1896-1898.

Asymmetric ketones with 2% cumene hydroperoxide at room temperature, and petroleum naptha with 2% cumene hydroperoxide at higher temperatures were effective in re-establishing efficient heat transfer rates. Diagrams, tables. 2 ref.

1304 Copolymerization Reactions of Cinnamic Acids, Its Derivatives, and Some Related Compounds. C. S. Marvel, G. H. McCain, Moses Pàsser, W. K. Taft, and B. G. Labbe. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2311-2317.

Reports rubber copolymers with butadiene which were roughly equivalent to GRS. Cololymers with other vinyl compounds are possible. Tables. 33 ref.

1305* Stress-Optical Investigation in Connection with Fatigue Phenomena in Rubber Goods. (German.) *Kautschuk und Gummi*, v. 6, no. 9, Sept. 1953, p. WT171-WT177; disc., p. WT177.

Describes methods for improving fatigue resistance. Photographs, diagrams, graphs. 9 ref.

1306* Plasticization of Polyvinylchloride by Butadien-Nitrile Copolymer. I. Influence of Butadine and Nitrile Groups on Compatability and Plasticization. (Russian.) R. A. Reznikova, A. D. Zaionchkovskii, and S. S. Voiutskii. *Kolloidnyi Zhurnal*, v. 15, no. 2, Mar.-Apr. 1953, p. 108-116.

Discusses 5 specially prepared copolymers of butadiene and nitrile of acrylic acid. Graphs, tables.

1307* Stressing Materials and Internal Damping in the Rebound Test. (German.) E. Schreuer. *Kolloid-Zeitschrift*, v. 132, nos. 2-3, Aug.-Sept. 1953, p. 75-78.

Presents experimental investigations on several commercial rubber mixtures. Graphs. 4 ref.

1308* Testing of Expanded Materials for Aircraft Production. (French.) B. Persoz. *Revue generale du cauotchouc*, v. 30, no. 7, July 1953, p. 492-498.

Discusses application for sound and heat proofing, rigidity, and insubmersibility. Describes various tests for determination of mechanical properties. Diagrams, tables. 7 ref.

1309* Natural Rubber Positive Latex in the Woolen Industries. (French.) M. Van Overbeke, G. Mazingue, and P. Outreman. *Revue générale du caoutchouc*, v. 30, no. 9, Sept. 1953, p. 642-647.

Describes characteristics of "Xetal". Discusses wear resistance, appearance, and reinforcing properties.

1310* "Cold" Rubber. (French.) Yvan Landler. *Revue générale du caoutchouc*, v. 30, no. 9, Sept. 1953, p. 647-654.

Discusses ways in which variations in molecular structure of GR-S depend on polymerization temperature. Presents an explanation of the corresponding properties. Tables, graphs, photographs. 44 ref.

1311 Limitations of Synthetic Rubber Packings for High Temperature Application. E. L. Carlotta and E. M. Hobein. *Rubber Age*, v. 74, Oct. 1953, p. 85-90, 134.

Concludes that improvement will come by new compounding ingredients, plasticizers, or antioxidants. Graphs.

1312* Polyurethanes. IX. New Types of Highly Elastic Products : Vulcollans. II. E. Müller, O. Bayer, S. Petersen, H. F. Piepenbrink, F. Schmidt, and E. Weinbrenner. *Rubber Chemistry and Technology*, v. 26, July-Sept. 1953, p. 493-509. Translated from *Angewandte Chemie*, v. 64, Oct. 7, 1953, p. 523-531.

Discusses cross-linking mechanisms and agents, including glycols, amino-alcohols and diamines. Diagrams, tables. 12 ref.

1313* Variables Controlling the Cross-Linking Reactions in Rubber. Bernard C. Barton and Edwin J. Hart. *Rubber Chemistry and Technology*, v. 26, July-Sept. 1953, p. 510-521.

Reports study of effect of time, temperature, and concentration of reactants on yield of intermolecular cross-links in 2-mercaptobenzothiazole-accelerated sulfur-vulcanization of Hevea rubber. Tables, graphs. 5 ref.

1314* The Vulcanization of Thick Sheets of Rubber. E. C. B. Bott. *Rubber Chemistry and Technology*, v. 26, July-Sept. 1953, p. 674-690.

Reports studies made of amount of vulcanization obtained for flat sheets of soft rubber and of extra time needed to obtain full vulcanization in center. Graphs, tables. 9 ref.

See also:
1262 (rubber sealing compounds)

43. SPACE HEATING AND CONDITIONING

1315 American Society of Heating and Ventilating Engineers, Transactions, (Annual Volume), v. 57, 1951. 556 p. American Society for Heating and Ventilating Engineers, Transactions.

Includes the following papers. "Losses from a Floor-Type Panel Heating System", F. W. Hutchinson, D. L. Mills, and L. J. LaTart; "Operating Experience and Data from a Sidewalk Snowmelting System", L. A. Stevens and G. D. Winans; "Design Factors in Panel and Air Cooling Systems", C. S. Leopold; "The Efficiency of Bituminous-Coal-Burning Space Heaters", J. W. Tieman and F. L. Bagby; "The Measurement of Smoke", K. O. Beatty, Jr. and J. E. Deas, Jr.; "Smoke Measurement in a Fuel Oil Test Unit", D. W. Locklin and G. V. Parmelee; "Rating of Fuel Oils by a Test Unit", D. W. Locklin and G. V. Parmelee; "A Survey of Electrostatic Precipitation", Eric A. Walker and J. E. Coolidge; "Theory of Earth Heat Exchangers for the Heat Pump", L. R. Ingersoll, F. T. Adler, H. J. Plass, and A. C. Ingersoll; "Factors Useful in Ground Grid Design for Heat Pumps", G. S. Smith; "Solar Energy Transmittance of Figured Rolled Glass", G. V. Parmelee and W. W. Aubele; "Field Studies of Heat Losses from Concrete Floor Panels", C. M. Humphreys, C. V. Franks, and L. F. Schutrum; "Principles of Effective Heat for Steam-Heated Structures", C. O. Mackey, N. R. Gay, R. D. Tutt, E. G. Powell, and E. L. Broderick; "Transportation Heating and Air Conditioning Systems and Controls", Norman O. Kirkby; "Water-Vapor Permeability of Building Papers and Other Sheet Materials", E. R. Bell, M. G. Seidl, and N. T. Krueger; "Use of Aircraft Propellers for Axial Flow Fans", Elmer C. Lundquist and M. J. Hamilton; "Roof Spray for Reduction in Transmitted Solar Radiation", G. E. Sutton; "Aluminum Ceiling Panels for Heating and Cooling", E. S. Howarth, S. C. Huddleston, and R. M. Koch; "Laboratory Studies of the Thermal Characteristics of Plaster Panels", C. M. Humphreys, C. V. Franks, and L. F. Schutrum; "Optimum Panel Surface Distribution Determined from Human Shape Factors", F. W. Hutchinson and Merl Baker; "Barometric Draft-Control Analysis", H. B. Nottage, D. W. Locklin, and R. G. Huebscher; "The Control of Air Streams from a Long Slot", Alfred Koestel and Chia-Yung Young; "Pressure Losses of Take-Offs for Extended-Plenum Duct Systems", J. W. Holl, S. F. Gilman, R. J. Martin, and S. Konzo; "Furnace Thermal Efficiency Determined from Flue and Jacket Loss", H. L. McPherson, K. L. Badger, and W. S. Zawada; "Heat Pump Application to a Newspaper Plant", J. Donald Kroeker, J. H. Bonebrake, and J. A. Melvin; "Two-Year Performance of a Heat Pump System Furnishing Year-Round Air Conditioning in Modern Office Building", Philip Sporn and E. R. Ambrose; "Climatology as an Aid in Heat Pump Design", G. S. Smith; "Heat Requirements of Buildings", C. W. Signor; and "Energy—Choose it Wisely Today for Safety Tomorrow", G. W. Gleeson.

1316 The Efficiency of Bituminous-Coal-Burning Space Heaters. J. W. Tieman and F. L. Bagby. *American Society of Heating and Ventilating Engineers, Transactions*, v. 57, 1951, p. 89-101; disc., p. 101-106.

Discusses the relationship between heater efficiency and rate of heat output for conventional surface-fired, refractory-lined, and crossfeed type smokeless stoves. Includes determination of added useful heat available within the house from the typical flue-pipe installation used between heater and chimney. Graphs, diagrams, tables.

1317 Theory of Earth Heat Exchangers for the Heat Pump. L. R. Ingersoll. *American Society of Heating and Ventilating Engineers, Transactions*, v. 57, 1951, p. 167-187; disc., p. 187-199.

Graphs, tables..

1318 Aluminum Ceiling Panels for Heating and Cooling. E. S. Howarth, S. C. Huddleston, and R. M. Kock. *American Society of Heating and Ventilating Engineers, Transactions*, v. 57, 1951, p. 343-360; disc., p. 360-362.

Describes tests on the above. Photographs, tables, graphs.

1319 Furnace Thermal Efficiency Determined from Flue and Jacket Loss. H. L. PcPherson, K. L. Badger, and W. S. Zawada. *American Society of Heating and Ventilating Engineers, Transactions*, v. 57, 1951, p. 459-466.

Discusses thermal efficiency of central heating warm-air furnaces determined by a simplified flue and jacket loss procedure.

1320* The Measurement of Dryness Fraction of Steam. N. Marshall. *British Coal Utilisation Research Association, Monthly Bulletin*, v. 17, July 1953, p. 269-279.

Describes intermittent and continuous methods. Tables. 32 ref.

1321 Operating Costs and Control of Heat Pump Installations. Wm. Henry Kwowlton. *Commercial Refrigeration and Air Conditioning*, v. 11, Nov. 1953, p. 106-107, 148.

Discusses economic efficiency of electricity as a fuel as compared to coal, oil, and gas.

1322* Controlling the House Heating Load. W. F. Friend. *Electrical World*, v. 140, Nov. 2, 1953, p. 88-90.

Describes how maximum benefits can be obtained through control of demand and refinement of regulating methods. Graph.

1323* Solar Energy: Past, Present and Future Applications. Harold Heywood. *Engineering*, v. 176, Sept. 25, 1953, p. 409-411.

Discusses utilization for heating, power generation, refrigeration, and air conditioning. Diagrams, graphs, tables. 12 ref.

1324* District Heating. A. E. Margolis. *Engineering*, v. 176, Oct. 9, 1953, p. 473-475.

Describes centralized supply of heat to group of buildings or section of town with final aim of extending supply of heat to area of whole town, similar to that of cold water, gas, or electricity. Suggests advantages of system. Table, graphs. (To be continued.)

1325 Delivering Air to Press Rooms. F. F. Stevenson. *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 77-79.

Describes new method to control temperature and humidity in press rooms. Photographs.

1326 Heating Plants Modernized. E. J. Watts. *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 80-81.

Discusses use of duplex steam pumps, de-aerating feedwater heaters, and other equipment to conserve steam. Diagram, photographs.

1327 Heating Arctic Buildings. Millard H. LaJoy and Gordon R. Whitnah. *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 90-93.

Describes use of reflective interior finishes. Diagrams.

1328 Big New Shopping Center. Joseph B. Olivieri. *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 102-106.

Describes central boiler plant for heating and cooling aid for the center. Diagrams, table.

1329 Distributing Air From a Luminous Plastic Ceiling. Lawrence G. Seigel and W. L. Bryan. *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 107-109.

Describes tests on air flow, noise, and velocity and suggests applications. Diagrams, photographs.

1330 Design and Performance of a Residential Earth Heat Pump. Merl Baker *Heating, Piping & Air Conditioning*, v. 25, Sept. 1953, p. 119-128; disc., p. 128-129.

Discusses design, performance, installation, and operating conditions. Photographs, graphs, tables, diagrams. 8 ref.

1331 Performance of Warm-Air Perimeter-Loop and Perimeter-Radial Systems in a Residence. H. T. Gilkey, R. W. Roose, and M. E. Childs. *Heating, Piping & Air Conditioning*, v. 25, Oct. 1953, p. 113-121; disc., p. 122-123.

Diagrams, tables. 10 ref.

1332 Temperature Control in Greenhouses. Norman J. Janisse. *Heating and Ventilating*, v. 50, Sept. 1953, p. 80-83.

Describes types, operation, and care of control systems. Diagrams, photograph.

1333 The Case for Designing Radiant Heating Panels to an Assumed Panel Water Temperature. William P. Chapman. *Heating and Ventilating*, v. 50, Oct. 1953, p. 83-86.

Relates surface temperature of panel to temperatures of water and surface area of panel. Tables, graphs.

1334 Flow and Fan. Principles of Moving Air Through Ducts. X. C. Harold Berry. *Heating and Ventilating*, v. 50, Oct. 1953, p. 90-94.

Discusses criteria and methods for selection of fans for specific duties. Graph, table. (To be continued.)

1335 The Freezing of Water in Pipes and Vessels. Richard S. Dill. *Heating and Ventilating*, v. 50, Oct. 1953, p. 95-102.

Gives account of experiments in which water was frozen in pipes of various configurations and in open vessels. Tables, diagrams.

1336 Some Modern Problems in Furnace Heating. R. J. Sarjant. *Institution of Gas Engineers, Copyright Publication no.* 423, 1953, 33 p. (TP700 In7.3c)

Reviews problems of furnace heating from the viewpoint of the user. Graphs, diagrams. 34 ref.

1337 The Functional Design of Gas- and Coke-Burning Appliances. Norman Hudson. *Institution of Gas Engineers, Copyright Publication no.* 427, 1953, 24 p. (TP700 In7.3c)

Considers changes in fuel usage in Britain and repercussions on the markets for gas and coke. Tables, diagrams.

1338 Controlled Heating and Air Conditioning in the Manufacture of Metal Products. Leo Walter. *Machinery (London)*, v. 83, Sept. 25, 1953, p. 619-622.

Includes diagrams, photographs. 6 ref.

1339* Two Companies Adopt Modern Unit Heater Systems. *Plant*, v. 8, Sept. 1953, p. 58-59.

Describes vertical and horizontal delivery units. Photographs.

1340 Solenoid Valves Channel Heat Pump Refrigerant. *Product Engineering*, v. 25, Sept. 1953, p. 144-147.

Gives flow chart and describes operation of apparatus. Diagrams, photographs.

1341* Vermiculite as a Fuel Saver. K. W. Cowling. *Refractories Journal*, v. 29, Sept. 1953, p. 371-377.

Describes history and occurence, constitution, behavior on heating, properties, and uses as thermal insulation.

44. *Textiles and Fibers*

1342* The Economies of Air Purification. Norman Sharpe. *Refrigerating Engineering*, v. 61, Sept. 1953, p. 959-963, 1022.

Discusses air pollution, health, and equipment savings by air purification. Gives methods of removing pollutants. Tables. 11 ref.

1343* Heat Transfer Film Coefficients for Refrigerants Boiling Inside Tubes. Merl Baker, Y. S. Touloukian, and G. A. Hawkins. *Refrigerating Engineering*, v. 61, Sept. 1953, p. 986-991; disc., p. 991.

Presents study of heat transfer to refrigerants flowing inside a horizontal 0.545-inch ID tube. Diagrams, graphs. 6 ref.

1344* Metastable Flow of Freon-12. P. F. Pasqua. *Refrigerating Engineering*, v. 61, Oct. 1953, p. 1084-1088A; disc., p. 1088-1131.

Discusses flow of saturated and sub-cooled liquid Freon-12 through small diameter orifices, short tubes, and nozzles. Presents method of calculation of flow rate. Photographs, diagrams, graphs.

1345* Heating in Industrial Plants. (Norwegian.) F. Berner-Nielsen. *Teknick Ukeblad*, v. 100, no. 35, Sept. 24, 1953, p. 755-761.

Discusses different methods. Tables, diagrams.

See also:
362 (prevention of corrosion in cooling systems)

44. TEXTILES AND FIBERS

1346* Flammability of Clothing Textiles. Cameron A. Baker. *American Association for Textile Technology, Papers*, v. 8, Sept. 1953, p. 194-198.

Describes apparatus used to measure rate of burning of textile materials. Photographs. 6 ref.

1347* Production and Properties of Acrilan. Frank J. Soday. *American Dyestuff Reporter*, v. 42, Sept. 14, 1953, p. 635-638.

Gives manufacture, properties, uses, and economic significance of "Acrilan", a synthetic polyacrylic staple fiber.

1348* The Application of Dyes to Textile Fibers at High Temperatures. Charles L. Zimmerman. *American Dyestuff Reporter*, v. 42, Sept. 14, 1953, p. 627-634.

Discusses principles of dyeing above 212 F; gives effects on dye stability and fiber tensile strength; and describes modern equipment. Micrographs, graphs, tables. 26 ref.

1349* Chemistry of Fully Synthetic Fibers. (German.) Heinrich Zollinger. *Chimia (Switzerland)*, v. 7, no. 10, Oct. 15, 1953, p. 222-230.

Presents a comprehensive review and history of the delevopment of synthetic fibers. Discusses chemical and molecular forces present in the formation of filamentary molecules. Tables, micrographs. 29 ref.

1350 Hydrocellulose Water Flow Number. Relationship to Fine Structures of Fibers, Particularly Fiber Orientation. O. A. Battista, J. A. Howsmon, and Sydney Coppick. *Industrial and Engineering Chemistry*, v. 45, Sept. 1953, p. 2107-2112.

The above relationship has been reduced to a quantitative basis by comparison of 7 sets of rayon samples with differing orientation histories. The water flow number will be useful in following fiber orientation changes in samples with known histories. Photographs, graphs, tables. 10 ref.

1351* Polymerisation of a Series of Vinyl Monomers in Wool. N. K. Boardman and M. Lipson. *Society of Dyers and Colourists, Journal*, v. 69, Sept. 1953, p. 335-338.

A series of acrylates and methacrylates were polymerized in wool by free-radical initiation from aqueous methyl alcohol. A direct relationship was observed between the hardness of the polymer and its effect on the elastic properties of single fibers. Graphs, tables. 11 ref.

1352* New Textile Fibers Created by Reaction of Cotton With Acrylonitrile. *Textile Industries*, v. 117, Oct. 1953, p. 138A-138D.

Gives processing method and properties of a new series of fibers. Tables, micrographs, photographs, graphs. 9 ref.

1353* Preparation of Soluble Yarns by the Carboxymethylation of Cotton. George C. Daul, Robert M. Reinhardt, and J. David Reid. *Textile Research Journal*, v. 23, Oct. 1953, p. 719-726.

Describes a one-step and a two-step method depending upon whether partial or complete solubility is required. Tables, photographs, graph. 9 ref.

1354* New, Stronger Tire Rayon is Safer, More Durable. *Textile World*, v. 103, Oct. 1953, p. 106-107.

Gives properties of "Super Cordura" and compares it to other high-tenacity rayons. Micrographs, graphs, table.

1355* Cavitomic Cotton May Be Draining Your Profits. Laura T. Hall. *Textile World*, v. 103, Oct. 1953, p. 133, 268, 270.

Based on paper presented at Textile Quality Control Assn., Clemson College, Clemson, S. C. Gives properties, method of detection, and data on amount usable without adversely affecting processing. 7 ref.

1356* New Techniques With Colored Fibers Make New Fabrics Possible. George M. Moisson. *Textile World*, v. 103, Oct. 1953, p. 141, 232, 234, 236.

Covers the acetates, "Celaperm", "Chromspun", "Fibro", "Merinova", and "Dynel".

See also:
882 (production of textile machinery)

45. THERMODYNAMICS

1357 A New Analogy in Transient Heat Conduction. R. E. Collins. *American Journal of Physics*, v. 21, Oct. 1953, p. 501-503.

Describes derivation of an equation of transient heat conduction that involves velocity of an isotherm and the rate of heat flow across it.

1358* The Collin Oven and Engineering Aspects of Gas Flow and Heat Transfer in Heating of Coke Ovens. H. Collin. (German.) *Collin Mitteilungen*, v. 4, no. 6, June 1953, p. 3-5. (TP315 C69)

Describes special features assuring uniform heating in all directions. Photographs.

1359 Design Charts for Symmetric Regenerators. A. M. Peiser and J. Lehner. *Industrial and Engineering Chemistry*, v. 45, Oct. 1953, p. 2166-2170.

Describes direct determination of design factors for low temperature heat regenerators. Graphs.

1360 Progress Review No. 26: Heat Transfer. *Institute of Fuel, Journal*, v. 26, Oct. 1953, p. 178-188.

Deals with conduction, forced convection, radiation, and heat exchangers. 200 ref.

1361 Heat Transfer. B. E. Lauer. *Oil and Gas Journal*, v. 52, Nov. 2, 1953, p. 135.

Presents equations for heat transfer between fluids and solids. 51 ref.

1362 Comparison of Effectiveness of Convection-, Transpiration-, and Film-Cooling Methods With Air as Coolant. E. R. G. Eckert and John N. B. Livingood. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3010, Oct. 1953, 52 p. (TL570 Un3t)

Material necessary for a comparison of cooling requirements is presented. The superiority of transpiration cooling is clearly shown for both laminar and turbulent flow. Graphs, diagrams. 11 ref.

See also:
1343 (heat transfer for refrigerants)

46. WELDING AND JOINING

1363* Effect of Arsenic on the Hot Working and Weldability of Copper. (German.) A. Schleicher. *Acta Technica Academiae Scientiarum Hungaricae*, v. 6, nos. 1-2, 1953, p. 201-207.

Discusses affects on weldability, quality of weld, tensile strength, and elongation. 13 ref.

1364* Silicones as Adhesives. *Adhesives & Resins*, v. 1, Apr. 1953, p. 13-15.

Certain silicones, which display this contrasting quality, find applications in electrical design.

1365* Boots and Shoes Are Using Most New Adhesives. E. F. Hall. *Adhesives & Resins*, v. 1, May 1953, p. 44-47.

Describes modified latex, hot melts, "stick-on" sole cements, and other specialties.

1366* Versatile New Epoxides. R. N. Wheeler. *Adhesives & Resins*, v. 1, May 1953, p. 48-53.

Discusses the chemistry of epoxides and their use as surface coatings, adhesives, potting compounds, and glass laminates. Photographs. 8 ref.

1367* The Theory of Adhesion. *Adhesives & Resins*, v. 1, June 1953, p. 84-87.

An introduction to recent studies. 6 ref.

1368 Starch Adhesives for Posters. C. J. Burton. *Adhesives & Resins*, v. 1, Sept. 1953, p. 192-195.

Discusses recent modifications endowing above with special qualities such as weather resistance.

1369 The Strength of Metal Joints Made With Synthetic Resins. K. Frey. *Aircraft Engineering*, v. 25, Oct. 1953, p. 317-320.

Reports on study of influence of geometry of lap joints on their strength. Diagrams, graphs, table. 7 ref.

1370 Sheet-Metal Welding. I. Fusion-Welding: Argon-Arc and Heliarc Processes. *Aircraft Production*, v. 25, Oct. 1953, p. 362-371.

Describes new developments in relation to various forms of fusion welding, particularly as applied to argon- and submerged-arc processes. Diagrams, photographs.

1371* Riveting in Light-Metal Structures.. (German.) E. W. Pleines. *Aluminium*, v. 29, no. 9, Sept. 1953, p. 370-374.

Discusses functions and qualities of cold-headed, light-metal rivets. Concludes that cold-upset rivets without heads meet minimum safety specifications. Diagrams, graph, table.

1372* Oxy-Acetylene Welding of Aluminum Materials. (German.) *Aluminium Ranshofen, Mitteilungen*, 1953, no. 2, July, p. 30-34.

Discusses weldability and procedure for welding Al and its alloys. Diagram, tables.

1373 Special Fixtures Speed Army Tractor Hull Welding. H. W. Lindsay. *American Machinist*, v. 97, Oct. 26, 1953, p. 113-117.

Describes plant layout, equipment, and procedure. Photographs.

1374 Machine Welds Powder Cans at 100 ipm. E. A. Hess. *American Machinist*, v. 97, Oct. 26, 1953, p. 118-119.

Automatic set up fastens head and bottom to body with 3 o'clock welds at high speed. Photographs.

1375* Influence of Electrode Coatings on Formation of Fish Eyes in Unalloyed Steel Weld Deposits and the Origin of Such Defects. (German.) Friedrich Erdmann-Jesnitzer and Hans Kowalkowski. *Archiv fur des Eisenhüttenwesen*, v. 24, nos. 7-8, July-Aug. 1953, p. 361-368.

Describes wood powder and kaolin as H_2 formers. Discusses fish eye formation and elimination by changing electrode coatings. Micrographs, diagrams, tables. 16 ref.

1376* The Fabrication of Copper Vessels. J. B. Carroll. *Australasian Engineer*, 1953, Feb., p. 56-57.

Describes procedures for welding Cu sheet. Diagrams.

1377 Automatic Welding in Castings Repair. *Canadian Metals*, v. 16, Oct. 1953, p. 54, 56, 58.

Reports tests which demonstrate merit of above, using a heavy steel casting for the investigation described. Photographs, table.

1378* The Metallurgy of Welding Manganese Steel. *Edgar Allen News*, v. 32, Oct. 1953, p. 222-224.

Describes technique for avoiding embrittlement. Micrographs, table. (To be concluded.)

1379* Modern Welding Technique. XIX. Stainless and Heat-Resisting Steels. XX. Miscellaneous Non-Ferrous Alloys. E. T. Gill and Eric N. Simons. *Edgar Allen News*, v. 32, Oct. 1953, p. 233-234.

Discusses gas, atomic hydrogen, and metallic arc welding of stainless steels, heat resisting steels, nickel, and nickel alloys. Table. (To be continued.)

1380 Current-Slope Control for Resistance Welders. R. O. Johnsen. *Electronics*, v. 26, Nov. 1953, p. 158-159.

Describes simple six-tube unit which permits control of build-up and decay rates of welding current and gives longer electrode tip life and more uniform welds on Al and Mg. Photograph, diagrams.

1381* Facts About Low Hydrogen Electrodes. Richard K. Lee and J. O. Cavanagh. *Industry & Welding*, v. 26, Oct. 1953, p. 90-92, 95-99.

Discusses history, effects of slag and H_2, welding procedures, and applications. Photographs, diagrams.

1382* Two Inert Gases are Used to Weld Ultra-Thin Metals. *Industry & Welding*, v. 26, Nov. 1953, p. 53, 54, 82.

Describes welding of stainless steel sections using argon on top and helium on the underside. Photographs.

1383* Flash Welding the Aluminum Alloys. Lester F. Spencer. *Industry & Welding*, v. 26, Nov. 1953, p. 66-68, 71, 72.

Describes process and critical factors to be controlled. Photographs, diagram. (To be concluded.)

1384 The Welding of Certain Heat-Resisting Steels. J. A. McWilliam. *Institute of Welding, Transactions*, v. 16, Aug. 1953, p. 96-99.

Reports comparison of metal arc welding of two steels and mechanical test results on parent metals and welds. Tables, photographs, graphs.

1385 The Schlieren Apparatus as a Research Tool in the Welding Industry. Walter Moen. *Instrument Society of America, Proceedings*, v. 7, 1952, p. 203-207.

Discusses the principle upon which schlieren apparatus is based; features of optical, mechanical, and electrical design of each of the components; and various techniques developed to meet requirements of problems.

1386 Brazing and Soldering Titanium. William Rostoker. *Light Metal Age*, v. 11, Oct. 1953, p. 11, 26.

Describes problems encountered and procedures employed.

1387 Induction Welding Process Speeds Light Metals Tubing Production. T. J. Crawford. *Light Metal Age*, v. 11, Oct. 1953, p. 14-15, 26.

Describes new process for fabrication of nonferrous metals. Diagrams, photographs.

1388 Automatic Arc Welding Aids Assembly of Diesel Engine Parts. Herbert Chase. *Machinery*, v. 60, Oct. 1953, p. 153-157.

Describes equipment used for submerged-arc welding of internal and external parts. Diagrams, photographs.

1389* Adhesives for Metal. *Mechanical World and Engineering Record*, v. 133, Oct. 1953, p. 449.

Reports that developments with polyvinyl formalin and phenol

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formaldehyde resins make possible strong joints between two metals and metals and non-metals.

1390* Procedure for Welding the 17% Chromium Stainless Steels. *Metal-Working*, v. 9, Oct. 1953, p. 20-21.

Discusses preheating and filler metals for welding; properties of welds; and applications and advantages of various types of welding. Tables.

1391* Assumptions and Directions for Deep-Penetration Welding. (German.) Herbert Neumann. *Schweissen und Schneiden*, v. 5, no. 8, Aug. 1953, p. 297-305.

Describes welding machines and applications. Photographs, graphs, tables, diagrams. 4 ref.

1392* Automatic Welding With "Fusarc" Electrodes. (German.) Camille De Rop and Hans Schmidt-Bach. *Schweissen und Schneiden*, v. 5, no. 8, Aug. 1953, p. 315-318.

Describes design, types, and uses in boiler shops and structural and maritime engineering. Photographs, tables, diagrams, graph.

1393* Recent Developments and Experiments in Submerged Arc Welding. (German.) W. Mantel and L. Wolff. *Schweissen und Schneiden*, v. 5, no. 9, Sept. 1953, p. 339-347.

Discusses characteristics, structure, and properties of welded joints; fluxes, welding electrodes, and new methods and equipment. Graphs, tables, photographs, diagrams. 4 ref.

1394* Safety Devices of Gas Generation and Supply Plants; Their Importance in Welding and Cutting Operations. (German.) M. Konschak and W. Scheruhn. *Schweissen und Schneiden*, v. 5, no. 9, Sept. 1953, p. 347-350.

Describes and evaluates devices used to prevent back firing and back flow of gas. Diagrams.

1395* Safety Measures for Oxy-Acetylene and Arc Welding. (German.) P. Steidl. *Schweissen und Schneiden*, v. 5, no. 10, Oct. 1953, p. 362-368.

Surveys general aspects. Discusses protection of eyes, body, and respiratory system. Tables, photographs, diagrams. 28 ref.

1396* Repair of Iron Castings by Welding. (German.) Hans Höll. *Schweissen und Schneiden*, v. 5, no. 10, Oct. 1953, p. 368-374.

Describes shrinkages and stresses of gray cast iron. Discusses carbon-arc welding with partial preheating, preheating and post heating; brazing; straightening of iron castings; and electric welding with pre- and post-heating. Photographs, micrographs, diagrams. (To be continued.)

1397* Two Rapid-Welding Methods. (German.) *Schweisstechnik*, v. 7, no. 6, June 1953, p. 73-75.

Describes "Gillemont" and "Humboldt-Meller" welding methods. Diagrams.

1398* Welding of "Torstahl". (German.) Stefan Soretz. *Schweisstechnik*, v. 7, nos. 7-8, July-Aug. 1953, p. 77-90.

Discusses flash-butt and electric-fusion welding, tempering, and testing of concrete-reinforcement steel rods. Diagrams, graphs, tables, photographs. 5 ref.

1399* Electric-Arc Welding of Aluminum. (German.) Benno Sixt, *Schweisstechnik*, v. 7, nos. 7-8, July-Aug. 1953, p. 90-93.

Describes conditions for welding Al and Al alloys. Diagrams, photographs, graphs, tables.

1400 Some Notes on the Control and Design of Parts for Resistance, Spot, Projection and Seam Welding. R. Bushell. *Sheet Metal Industries*, v. 30, no. 318, Oct. 1953, p. 879-884.

Discusses influence of pressure on electrodes, weld time, and secondary current. Diagrams, photographs, tables.

1401* Correct Welding Procedure. IV. Lester F. Spencer. *Sheet Metal Worker*, v. 44, Sept. 1953, p. 87-89.

Describes welding of steel coated with Sn, terne, Cr, Ni, or Cd. Tables. (To be continued.)

1402* Correct Welding Procedure. V. Welding of Aluminum Base Alloys I. Lester F. Spencer. *Sheet Metal Worker*, v. 45, Oct. 1953, p. 61-62, 64, 71, 72.

Discusses fusion welding by resistance, flame, and arc methods. Gives brief tabulation of compositions and mechanical properties of Al alloys. Tables, photographs. (To be continued.)

1403* The Deposition Rates for Arc-Welding Electrodes and Their Tolerances. (Dutch.) P. G. Weeber. *Smit Mededelingen*, v. 8e, no. 2, Apr.-June 1953, p. 57-58; disc., p. 58-59.

Discusses melting speed of welding rods as a function of amperage. Graph.

1404* Argon Arc Welding in the Automobile-Body Industry. (Dutch.) P. J. Verlee. *Smit Mededelingen*, v. 8e, no. 2, Apr.-June 1953, p. 63-64.

Discusses electric-arc welding under an inert-gas atmosphere. Tables, photograph.

1405* Some Problems on the Weldability of Steel. The Effect of Segregation on the Weldability of Normal Structural Steel. (Dutch.) A. Ph. Krijff. *Smit Mededelingen*, v. 8e, no. 2, Apr.-June 1953, p. 65-70; disc., 70-72.

Discusses possible causes of defective welds. Tables, photographs, micrographs.

1406* The Cracking of Weld Joints. (Dutch.) G. Westendorp. *Smit Mededelingen*, v. 8e, no. 3, July-Sept. 1953, p. 87-94.

Discusses shrinkage stresses, solidification of welds, mechanical properties at high teperatures, and crack-sensivity of different types of fillet welds. Diagrams, graphs, photographs. 10 ref.

1407* Electrode News. (Dutch.) *Smit Mededelingen*, v. 8e, no. 3, July-Sept. 1953, p. 95-96.

Describes Inversa and Pergo electrodes. Diagrams, photographs.

1408* Control of Spot Welding by Measuring the Welding Parameters (Current and Pressure). (French.) L. Pletier. *Soudure et Techniques connexes*, v. 7, nos. 7-8, July-Aug. 1953, p. 171-179.

Describes apparatus which registers electrode pressure and current. Diagrams, tables, photographs.

1409* Load Voltage in Arc Welding With Coated Electrodes; Influence on Electrical Characteristics of Welding Equipment. (French.) M. Moneyron. *Soudure et Techniques connexes*, v. 7, nos. 7-8, July-Aug. 1953, p. 191-197.

Discusses nature of coatings, intensity and density of current, and arc length. Tables, graphs.

1410* Development of Plain Carbon Steel Welding Electrodes; Influence on Electrical Characteristics of Welding Hans Schmidt-Bach. *Stahl und Eisen*, v. 73, no. 19, Sept. 10, 1953, p. 1212-1215.

Describes good bead formation without pores. Discusses results of fatigue tests under pulsating stresses and folding, tensile, and notched-bar impact tests. Tables, graphs, photographs. 12 ref.

1411* Building-Up of Cutting Tools by Electric Arc. (Russian.) M. S. Poliak and G. A. Proskin. *Stanki i Instrument*, v. 24, no. 6, June 1953, p. 21-23.

Compares alloys and presents methods of preparation. Discusses electrode selection. Tables, graphs, diagrams. 5 ref.

1412 Argon-Arc Welding of Copper and Copper Alloys. Edwin Davis and E. A. Taylor. *Welding and Metal Fabrication*, v. 21, Oct. 1953, p. 370-376.

Describes equipment, materials, and techniques. Micrographs, tables. 7 ref. (To be continued.)

1413 Self-Adjusting Arc Welding of Aluminium Alloys. J. E. Tomlinson and J. G. Young. *Welding and Metal Fabrication*, v. 21, Oct. 1953, p. 377-386.

Describes equipment and procedure. Graphs, tables, micrographs, photographs.

1414 Controlled Spot Welding of Light Alloys for Aircraft Production. II. N. K. Gardner. *Welding and Metal Fabrication*, v. 21, Oct. 1953, p. 392-401.

Discusses inspection techniques and design data. Graphs, tables. 8 ref.

1415 What Goes Into a Welding Electrode? II. D. L. Mathias. *Welding Engineer*, v. 38, Oct. 1953, p. 66-68, 70.

Discusses physical formulation of coating composition and effect of physical factors on duties of electrode coating. Photographs, graphs.

1416 Carbide Segregation in 1 1/4 Cr-1/2 Mo Steel Pipe Welded Joints. I. A. Rohrig and H. S. Blumberg. *Welding Journal*, v. 32, Sept. 1953, p. 815-822.

Reports results of tests on weldability and response to post-welding heat treatments. Emphasis is on carbide segregation and prevention. Tables, micrographs.

1417 Arc Welding of Ferritic and Austenitic Nodular Cast Iron. J. Sohn, W. Boam, and H. Fish. *Welding Journal*, v. 32, Sept. 1953, p. 823-833.

Describes studies on filler wires for jet engines assemblies. Photographs, tables, diagrams.

1418 A Comparison of Shielding Mixtures for Gas-Shielded Arc Welding. J. W. Cunningham and H. C. Cook. *Welding Journal*, v. 32, Sept. 1953, p. 834-841.

Discusses shielding qualities of gas and effect on arc characteristics and resultant weld deposit. Photographs, graphs, diagrams.

1419 Porosity in the Welding of Carbon Steel. Glenn W. Oyler and Robert D. Stout. *Welding Journal*, v. 32, Sept. 1953, p. 454s-560s.

Discusses effects of current density, deoxidation practice of electrodes and base metal, and addition agents to the inert-gas atmosphere on formation of porosity in inert-gas-shielded metal-arc welds in C steels. Tables, graphs, photographs.

1420 Thermal Cycles in the Arc Welding of ½ In. Titanium Plate. E. F. Nippes, J. M. Gerken, B. W. Shaff, and E. C. Nelson. *Welding Journal*, v. 32, Sept. 1953, p. 461s-474s.

Discusses microstructures and mechanical properties relating to optimum welding conditions. Tables, graphs. 6 ref.

1421 Hard-Zone Crack Sensitivity and Strength of Two Low-Alloy Steels. C. L. M. Cottrell, J. G. Purchas, and B. J. Bradstreet. *Welding Research*, v. 7, Aug. 1953, p. 76-79.

Describes mechanical and weldability tests. Effect of heat treatment at various temperatures on mechanical properties and microstructure of 2 steels was studied. Tables, graphs, photographs. 2 ref.

1422 Self-Adjusting Arc and Controlled-Arc Welding Processes. W. G. Hull and J. C. Needham. *Welding Research*, v. 73, Aug. 1953, p. 80-95.

Deals with essential features and fundamental aspects of processes, such as arc characteristics and material transfer. Reports information available on welding of ferrous and non-ferrous materials. Tables, photographs, graphs, diagrams. 25 ref.

1423* Low Hydrogen Electrodes, Fundamentals and Applications. Richard K. Lee and J. O. Cavanagh. *Western Machinery and Steel World*, v. 44, Oct. 1953, p. 101-105.

Discusses history, growth, basic fundamentals on effect and control of H_2, welding procedures, and applications. Diagrams, photographs.

1424* Fusion Welding Provides Projection-Free Surfaces On High-Heat Super Alloys. J. R. Fullerton. *Western Metals*, v. 11, Oct. 1953, p. 78-81.

Describes types of shielded arc welding including "Heliarc", "Sigma", "Unionmelt", atomic hydrogen, and coated electrode methods. Photographs.

See also:

368 (corrosion action of acids on Al welds)
773 (welded joints in machines)
887 (organic fillers for welding joints)
917 (welding of Cr steels)
925 (stress relieving in welded structures)
980 (impact strength of welded joints)
1028 (arc welding of steel alloy pipe)
1029 (strength of fillet welds)
1046 (automatic welding of sheet metal parts)
1048 (welding of Ti)
1131 (crystallization during welding)
1195 (nondestructive testing of welds)
1197 (radiographic examination of welds)
1198 (ultrasonic testing of welds)
1259 ("welding" of plastics)
1264 ("welding" of teflon)
1271 ("welding" of plastics)

47. WOOD AND FOREST PRODUCTS

1425* The Bartrev Press. *Adhesives & Resins*, v. 1, Aug. 1953, p. 157-162.

Describes the manufacture of hardboard by this continuous process. Photographs.

1426 Hardwood as Raw Material for Viscose Pulps. G. M. Vyas. *Journal of Scientific and Industrial Research*, v. 12, sec. B, Aug. 1953, p. 366-372.

Reports investigations on the preparation and purification of viscose grade pulps from paper birch. Tables, graph. 24 ref.

1427* Complete Report. St. Regis "Jax" Mill. *Pulp & Paper*, v. 27, Sept. 1953, p. 54-56, 59, 62-63, 66, 68.

Reports on plant layout, nuisance elimination, woodyard and flume system, labor saving devices, and instrumentation. Diagrams, photographs.

1428* Heavy Pine Sawmill Waste—A Supplement to Round Wood for Pulp Production. Roswell D. Carpenter. *Southern Lumberman*, v. 187, Aug. 1, 1953, p. 36, 38, 40, 42.

Discusses possibility of utilizing slabs, edging strips, and trims for paper pulp production.

1429* Preparation of Hardboard from White Oak. S. L. Schwartz. *Tappi*, v. 36, Oct. 1953, p. 445-451.

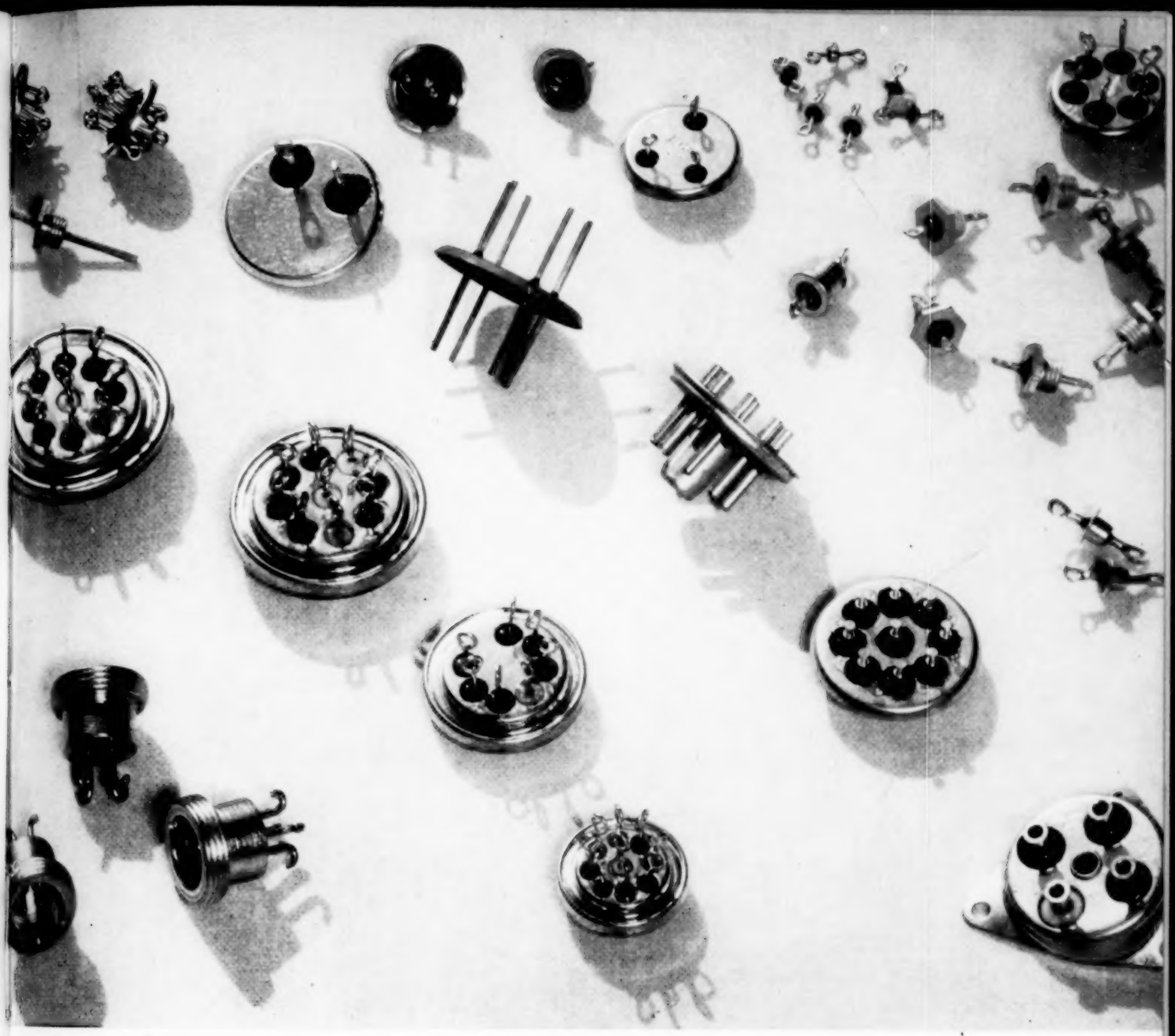
Discusses special techniques required. Photographs, charts, tables. 8 ref.

1430* Effect of Light on Coated Groundwood Papers. William K. Wilson and Jack L. Harvey. *Tappi*, v. 36, Oct. 1953, p. 459-461.

Summarizes an investigation of degree of protection against light by commercial clay coatings. Tables. 23 ref.

1431* Wood Preservation. H. A. Haenseler. *Western Union Technical Review*, v. 7, Oct. 1953, p. 130-136.

Discusses historical background, decay, insect attack, and preservatives. Photographs, diagrams. 3 ref.



GLASS AND METAL SEALS

The jewel-like seals shown here are used as connections to hermetically sealed electrical equipment. They are gas tight, and they retain their high electrical resistance even at the temperatures encountered in the operation of electric motors. Moreover, the glass and the glass-to-metal seals stand up to the thermal shock of being soldered or welded in place. These deceptively simple little devices are the products of broad research, including the development of glasses with good electrical resistance and sealing qualities, electroplating techniques for the metal parts, and manufacturing methods and equipment for turning out the seals, called Fusites, economically on a continuous basis.

BATTELLE INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. The results of much of this research are published for the general encouragement of science and industry, and to benefit the public welfare.

Fields of research at Battelle include agriculture and practically all the industrial and engineering sciences.

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